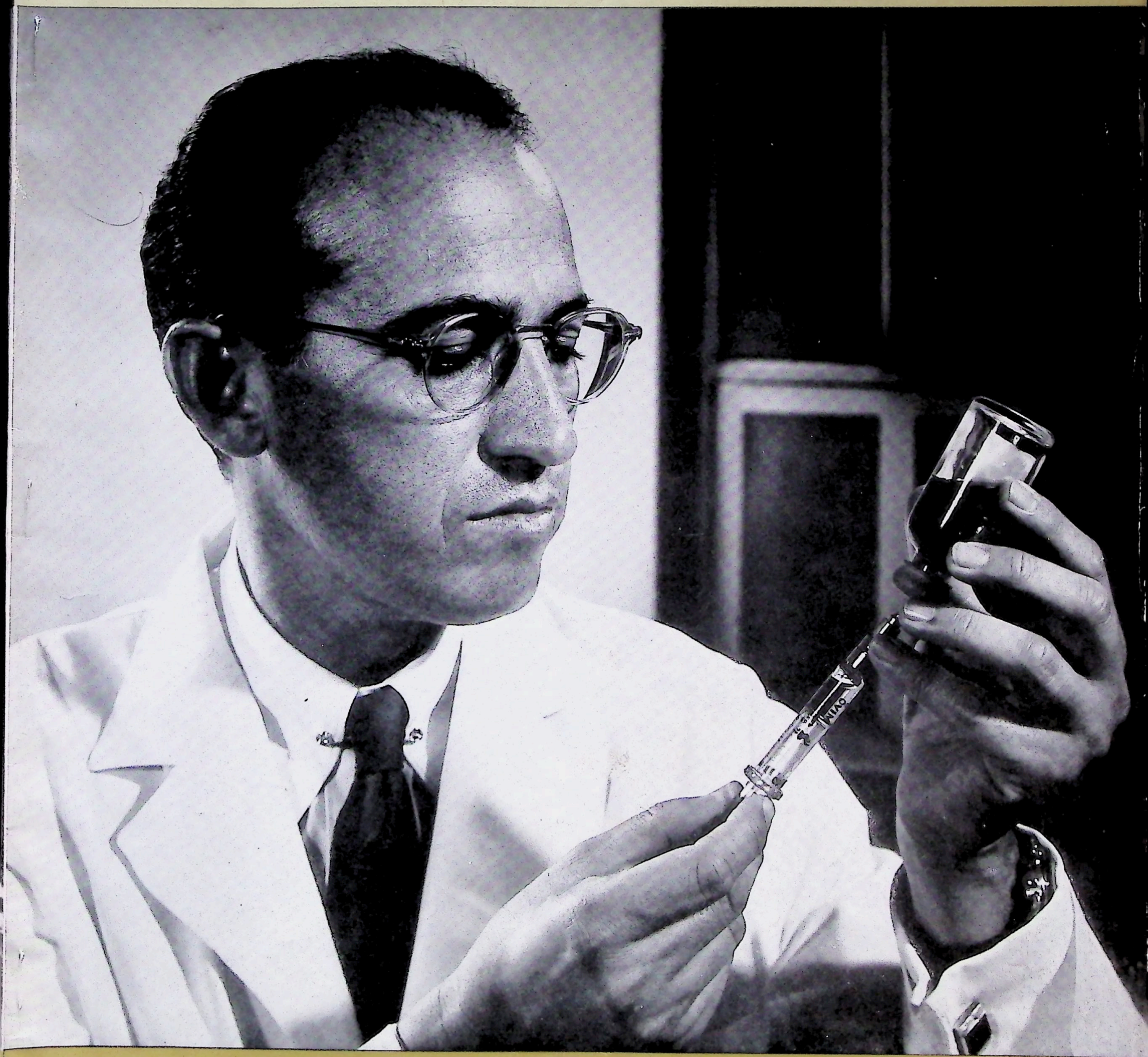
WISDOM

THE MAGAZINE OF KNOWLEDGE FOR ALL AMERICA



DR. JONAS E. SALK portrait by Karsh of Ottawa

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Pictorial History of Pharmacy • Confucius

Conversation with Historian Arnold Toynbee

AUGUST 1956

ONE DOLLAR

Great Men of Medicine

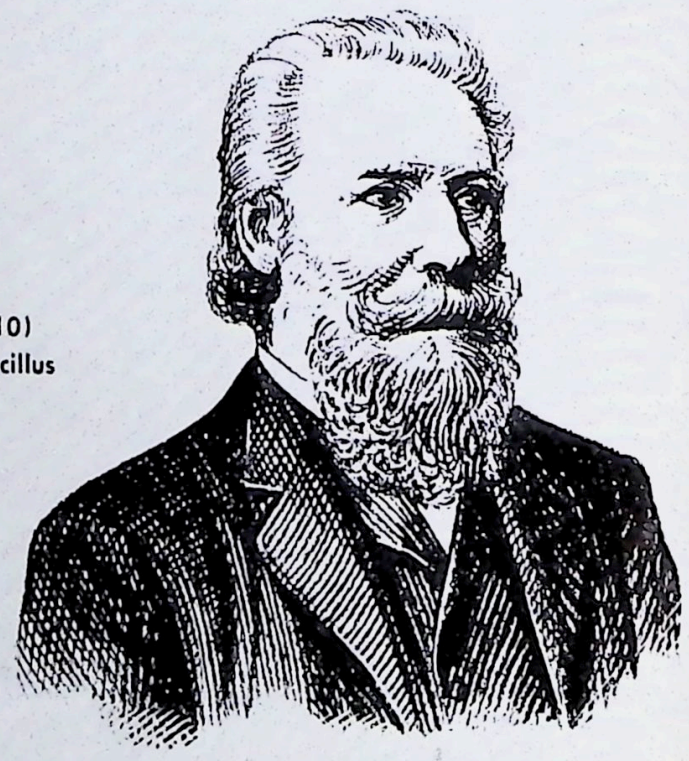
JACQUES B. WINSLOW (1669-1760)
Pioneered in detailed dissection

WILLIAM C. GORGAS (1854-1920)
Researcher on yellow fever

WILHELM K. ROENTGEN (1845-1923)
Discovered the X-ray

CLAUDE BERNARD (1813-1878)
Father of experimental medicine

ROBERT KOCH (1843-1910)
Discovered tuberculosis bacillus



CARL J. EBERTH (1835-1926)
Established aseptic surgery

IVAN P. PAVLOV (1849-1936)
Experimented with glandular secretions

WALTER REED (1851-1902)
Discovered cause of yellow fever

WISDOM

THE MAGAZINE OF KNOWLEDGE FOR ALL AMERICA

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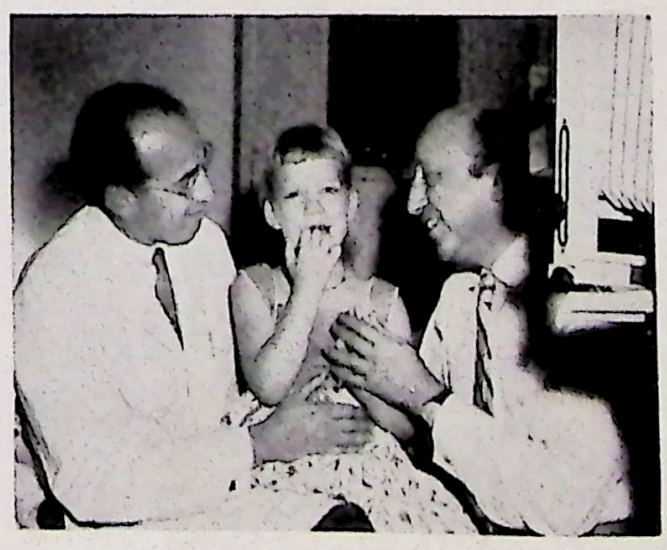

Dr. Jonas E. Salk (left) and photographer Yousuf Karsh of Ottawa calm the fears of a youthful volunteer for a polio inoculation, prior to taking the cover portrait for WISDOM in Doctor Salk's laboratory in Pittsburgh.

VOL. 1, NO. 8 **EXECUTIVE, EDITORIAL AND ADVERTISING OFFICES — 8800 WILSHIRE BOULEVARD, BEVERLY HILLS, CALIFORNIA** **AUGUST 1956**

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LETTERS FROM READERS

As my parents were in the book and publishing business, I have been a bibliophile since the age of six.

Now at 63 and retired, I still cling to my first love (my second love being materia medica), so that I look forward every month to receiving your wonderful magazine, WISDOM. It enables me to relax in my easy chair and takes me to the finest libraries of the world with no effort on my part.

I find your magazine more soothing in this tense mid-century era than anything I have tried.

Wish you success in your bold undertaking.

HERMAN TOMASHOFF
Belle Harbor, N. Y.

After enjoying reading WISDOM, I regarded it as an excellent adult magazine. You can then imagine how delighted I was to find that my two teenage "Rock 'n Roll-ers" picked up my copies, and read them with the same intense interest and fascination that I found in them.

I can't account for their sudden interest in antibiotics and Mozart—however, I sure am pleased that apparently the presentation of WISDOM'S wisdom has appealed sufficiently to the enthusiasts of the "Crew Cuts" and Fats Domino, so that they read these and other articles, which indeed is a great relief to worried parents.

Somehow, WISDOM has achieved a unique balance in presentation, that appeals to all age groups, and is making a real contribution to Americana.

JOSEPH M. BERNSTEIN, Pres.
Bernstein & Co., Inc.
Providence, R. I.

No longer will I wonder over the choice of a wedding gift! WISDOM contains all the goodness, beauty, and interest that I would wish for my newly married friends.

Your superb magazine continues to please me more at every turn, and I feel privileged to be a subscriber. It contains so very much, and I shall hoard them and share them with others.

GERALDINE HALL
Portland, Ore.

Words haven't been found yet to express my feelings for WISDOM.

Since reading this most outstanding publication, I have gained something I would never have obtained at any price from any other magazine.

I will never be able to thank you enough.

W. COURTLAND ROBINSON
Earlington, Ky.

When the editors designed and compiled WISDOM six long issues ago, they might have had the thoughts and convictions of William Cowper when he asserted: "Knowledge dwells in heads replete with thoughts of other men — Wisdom in minds attentive to their own."

WISDOM magazine is so vast in scope and dimension that a word of definition would not suffice nor be justified in an attempt to measure the value and gratification that emanates from its pages. I cannot define it — only commend it.

As an afterthought on the subject of WISDOM I might add a few modern lines from the play "The Teahouse of the August Moon":

"Pain makes a man think,
Thought makes a man wise,
Wisdom makes life endurable."

J. R. BARRETT
Coombs & Co.
Washington, D.C.

Never has a finer magazine come into my home!

MRS. HALLIE T. BOOTHE
Gonzales, Texas

I have read and enjoyed WISDOM with much interest. It is without doubt a magazine of the highest calibre.

SAM SAMPSON, Pres.
Swank, Inc.
New York, N. Y.

I am a teacher of English and social studies and I have just become acquainted with WISDOM magazine. It is a marvelous source of information for both me and my students. May I compliment you on the excellence of the material . . . such a magazine should be in the library of every school, as well as in the homes of all educated people.

ELLEN W. FAIRFAX, Principal
Eastern Junior High School
Riverside, Conn.

I'm sure you remember the saying, "Small minds discuss people, mediocre minds discuss things, great minds discuss ideas." It gives me the wonderful sensation of being a great mind just to read WISDOM. Thank you so much for having the adventuresome spirit to publish it.

MRS. GERALD GILL
Ft. Lauderdale, Fla.

I have been a subscriber to WISDOM since it was first published. WISDOM bridges the hiatus between the ordinary and the sublime — a potent stimulant to progressive thought.

THEODORE EPSTEIN
Attorney at Law
Denver, Colo.

WISDOM is one of the most attractive publications I have seen. I think you are performing a very excellent service because each of us needs to be reminded from time to time of the personal philosophies of both the small and the great men who contribute to what you have so aptly called WISDOM.

DR. A. R. ROOT, Vice-Pres.
Director of Media and Research
Knox Reeves Advertising, Inc.
Minneapolis, Minn.

Words are inadequate with a beautiful painting. Words are inadequate for WISDOM. Thank you, humbly, for giving us such a priceless magazine at this time.

HELEN CLUTE YORK
Maywood, Ill.

I find WISDOM most interesting. Your page layouts and handling of art are superb.

HUDSON MEYER, Vice-Pres.
The Caples Company
New York, N. Y.

I thought you would like to know how delighted I am with the refreshing, uplifting and cultural articles in WISDOM. It removes one from the noise and confusion of our present day civilization and brings us closer to the true realities of life.

C. H. PILL
Pacific Palisades, Calif.

WISDOM is a real contribution to lifting the mental and spiritual standards of men . . . and each issue so far has been a thrilling and inspiring one. It is the kind of magazine that America has needed for a long time. More power to you.

WILFRED A. PETERSON
Grand Rapids, Mich.

WISDOM has brightened up the world for us.

ANNE CONWAY
Pittsburgh, Pa.

It is certainly a pleasure to be given the privilege of reading WISDOM magazine. The simplicity, yet completeness of every article is an achievement rarely found in today's fast-moving field of literature. The diversified selection of articles seems to offer more than something for everyone's particular interests.

My wife and I join the thousands of Americans who thank you most cordially for providing the nation with a magazine of superb quality.

FRANCIS E. PEEK
R. T. Harris Adv. Agcy., Inc.
Salt Lake City, Utah

By publishing WISDOM you are rendering a great service to the American public.

D. D. RUNES
Philosophical Library
New York, N. Y.

Our highest esteem and gratitude to you all on the staff of WISDOM who make it possible for us to get so much knowledge and joy out of a single magazine.

MRS. LOUIS KOVACS
Mt. Vernon, N. Y.

May I compliment you on the distinguished format of your magazine WISDOM and on your most dignified presentation of the excellent selection of articles found within. It is greatly appreciated.

JACK W. MINOR
General Sales Manager
Dodge Division
Chrysler Corporation
Detroit, Mich.

I am completely satisfied by the superior qualities of WISDOM. I shall have this literature in my study to use in my work as Director of Religious Education. Thank you so very much for giving to the Nation such a magazine of quality.

SAM BRANT
Educational Director
Westminster Baptist Church
Westminster, S. C.

WISDOM is a credit to the American reading tastes.

MRS. JOANNE B. ANDERSON
Chicago, Ill.

I want to thank you personally for your courage and foresight in publishing so outstanding a periodical. WISDOM is the forerunner of the press of the future. I'm sure there are many people who wish they had the guts to do what you are doing.

M. WILLOWS, Secy-Treas.
California Limestone Products
Beverly Hills, Calif.

May I take this opportunity to tell you what a wonderful magazine you have created. I hope you prosper!

EMIL CORWIN
Special Inform. Liaison Off.
Food & Agriculture Org.
of the United Nations
New York, N. Y.

I found WISDOM most interesting and was particularly impressed by the beauty of its layout.

K. S. GINIGER, Vice-Pres.
Hawthorn Books, Inc., Publishers
New York, N. Y.

I am much impressed with WISDOM as a real class magazine.

GEORGE M. HAYES, Vice-Pres.
Marshall Field Enterprises, Inc.
Chicago, Ill.

I like WISDOM very much and believe that it fills a much-needed place among our publications.

ROBERT R. YOUNG
Chairman of the Board
New York Central System
New York, N. Y.

In this issue WISDOM *salutes the men in white—the physicians, surgeons, pharmacists, researchers—who labor tirelessly and courageously for the benefit of all mankind. Many tributes have been paid to the men and women of medicine, both the famed heroes and the unsung. These words of the eminent American surgeon, Sir William Osler, perhaps best define the challenge of their humane calling.*

TO THE MEN OF MEDICINE . . .

To wrest from nature the secrets which have perplexed philosophers in all ages, to track to their sources the causes of disease, to correlate the vast stores of knowledge, that they may be quickly available for the prevention and cure of disease – these are your ambitions.

To carefully observe the phenomena of life in all its phases, normal and perverted, to make perfect that most difficult of all arts, the art of observation, to call to aid the science of experimentation, to cultivate the reasoning faculty, so as to be able to know the true from the false – these are your methods.

To prevent disease, to relieve suffering and to heal the sick – this is your work.

The profession in truth is a sort of guild or brotherhood, any member of which can take up his calling in any part of the world and find brethren whose language and methods and whose aims and ways are identical with his own . . .

You enter a noble heritage, made so by no efforts of your own, but by the generations of men who have unselfishly sought to do the best they could for suffering mankind. Much has been done, much remains to do; a way has been opened, and to the possibilities in the scientific development of medicine there seems to be no limit.

Except in its application, as general practicioners, you will not have much to do with this. Yours is a higher and more sacred duty.

Think not to light a light to shine before men that they may see your good works; contrariwise, you belong to the great army of quiet workers, physicians and priests, sisters and nurses, all over the world, the members of which strive not neither do they cry, nor are their voices heard in the streets, but to them is given the ministry of consolation in sorrow, need, and sickness.

Like the ideal wife of whom Plutarch speaks, the best doctor is often the one of whom the public hears the least; but nowadays, in the fierce light that beats upon the hearth, it is increasingly difficult to lead the secluded life in which our best work is done.

To you the silent workers of the ranks, in villages and country districts, in the slums of our large cities, in the mining camps and factory towns, in the homes of the rich, and in the hovels of the poor, to you is given the harder task of illustrating with your lives the Hippocratic standards of Learning, of Sagacity, of Humanity, and of Probity.

The practice of medicine is an art, not a trade; a calling, not a business; a calling in which your heart will be exercised equally with your head. Often the best part of your work will have nothing to do with potions and powders, but with the exercise of an influence of the strong upon the weak, of the righteous upon the wicked, of the wise upon the foolish.

To you, as the trusted family counsellor, the father will come with his anxieties, the mother with her hidden grief, the daughter with her trials, and the son with his follies. Fully one-third of the work you do will be entered in other books than yours.

Courage and cheerfulness will not only carry you over the rough places of life, but will enable you to bring comfort and help to the weak-hearted and will console you in the sad hours when, like Uncle Toby, you have "to whistle that you may not weep . . ."

The physician needs a clear head and a kind heart; his work is arduous and complex, requiring the exercise of the very highest faculties of the mind, while constantly appealing to the emotions and finer feelings. At no time has his influence been more potent than at present, at no time has he been so powerful a factor for good . . .

So it will be your highest mission to carry on the never-ending warfare against disease and death, better equipped, abler men than your predecessors, but animated with their spirit and sustained by their hopes, "for the hope of every creature is the banner that we bear . . ."

William Osler

ACKNOWLEDGING THE MEN AND WOMEN OF WISDOM

SIR WILLIAM OSLER (1849-1919) was born at Bond Head in Canada and educated at Trinity College in Toronto and McGill University in Montreal, where he took his M.D. degree in 1872. He was renowned as a physician, teacher and medical historian. "To the Men of Medicine" is composed of excerpts from addresses to doctors and medical students during his long career. Throughout his career he was a source of inspiration to younger medical men – he lived by the Hippocratic Oath of his profession. He made eminent contributions to the study of injections of the heart, angina pectoris, malaria and other diseases. In 1911 he was knighted for his outstanding work and as an author wrote "The Principles and Practice of Medicine" and "A Concise History of Medicine."

FREDERICK MAYER is one of the outstanding young philosophers in the United States. Author of eight books and over a hundred articles, he is a professor of philosophy at the University of Redlands (Calif.). His feature this month gives an insight to Walt Whitman's philosophy.

GEORGE A. BENDER & ROBERT A. THOM'S "History of Pharmacy" is the result of many years of research and travel. Mr. Bender is a pharmacist and was educated at the Division of Pharmacy of South Dakota State College. He has been awarded an honorary degree of Master in Pharmacy from the Philadelphia College of Pharmacy and Science. For the past 27 years he has followed a career in pharmaceutical journalism and has been editor of "Modern Pharmacy," "North Western Druggist" and "American Druggist." Robert A. Thom is a native of Michigan and studied art at the Columbus Institute of Fine Arts. For a number of years he operated a commercial art studio in Detroit and gave up this enterprise to devote his time to serious painting.

DR. NOAH D. FABRICANT is a practicing otolaryngologist, and assistant Professor of Otolaryngology at the University of Illinois College of Medicine. His research on nasal medication and upper respiratory infections won him the Casselberry Prize for meritorious research in 1941. He is an Editorial Associate of the "Journal of the American Medical Association," Contributing Editor of the "American Journal of the Medical Sciences," and Editorial Consultant for the "Crippled Child Magazine." As an author-editor he has published nine books and 250 articles – for the medical profession and for the lay public. "Why They Became Doctors" is from the foreword of his book "Why We Became Doctors," © 1954 by Grune & Stratton, New York.

T. W. WALLBANK & ALASTAIR TAYLOR'S "Doctors, Diseases and Drugs" is from "Civilization Past and Present," Vol. 2, third edition, by Wallbank and Taylor, © 1955 by Scott, Foresman & Company, and used with their permission. The distinguished authors are well known for their writings. T. Walter Wallbank is currently a professor of history at the University of Southern California; he has also studied in London and Europe, as well as having published several books and papers on India and the development of that country. Alastair M. Taylor has been a member of UN Secretariat and an editor of the official "United Nations Bulletin." He taught history at the University of Southern California from 1938 to 1941 and during the war scripted documentary films for the National Film Board of Canada. He is presently living in Manotick, Ontario.

ALLAN NEVINS is a teacher as well as an author, and has been a Professor of American History at Columbia University since 1931. He is the author of "The Life of Will Rogers," "The Gateway to History," "Grover Cleveland – A Study in Courage" (which won him a Pulitzer prize for the best biography of 1932), and many other books. He is presently General Editor of the American Political Leaders Series. "From Campfires, Cities . . ." is from Mr. Nevins' "Fremont, Pathmarker of the West," published by Longmans, Green and Co., © 1955.

LISLE MARCH PHILLIPPS had a varied career as a tea-planter (Ceylon), soldier, merchant mariner, and traveler as well as achieving fame as an art critic and author. "The Power of the Nile" is reprinted from "The Works of Man," by Lisle March Phillipps, published in 1951 by Philosophical Library, New York. This is perhaps Mr. Phillipps' most famous book and is known as a classic work of art criticism. Mr. Phillipps died in 1917.

JOHN A. POPE was born in Detroit, Michigan, August 4, 1906. He has studied at Harvard, Yale and the University of London. A well-known author of books and articles on Chinese art, he has lectured on Chinese art at Columbia University and since 1946 has been assistant director of the Freer Gallery of Art. "The Chinese Mind" is from "China" by A. G. Wenley and John A Pope, Smithsonian Institution Publication No. 3770, 1944.

LIN MOUSHENG'S "Confucius – Ancient China's Wisest Man" is from his book, "Men and Ideas," © 1942 by The John Day Company, Inc. Mr. Mousheng was born in China, near Foochow and graduated from Fukien Christian University in 1926. Later he obtained his M.A. degree from Oberlin College. In 1937 he was awarded his Ph.D. from the University of Chicago. Since 1941 he has been editor of "Contemporary China."

CHARLES L. ANSPACH is president of the Central Michigan College of Education, Mount Pleasant, Michigan. "Candles in the Dark" is from a speech he delivered at the College in 1955 and is reprinted from "Vital Speeches of the Day," Vol. XXI, No. 19, © 1955 by City News Publishing Company. Mr. Anspach is the author of "A Study of Records and Reports" and co-author of "Problems in Educational Sociology" and "A Manual of Observation Problems."

THUCYDIDES (c. 460-c. 400 B.C.) is considered one of the greatest of the ancient Greek historians. As a general in 424 B.C. he failed to prevent the surrender of the city of Amphipolis to Sparta and was exiled until the end of the war. He thus had opportunity to acquaint himself with both sides fighting and to acquire first-hand information on the Peloponnesian War. His one work – an incomplete history of this war – abruptly ended in 411 B.C. The outstanding feature of his writing is his speeches; the most splendid of these is Pericles' funeral oration, from which we have taken "Men and Ideas."

ARNOLD JOSEPH TOYNBEE is one of the famous men of our time. A British historian, he was born in London, April 14, 1889. His chronicling of history is considered one of the most important literary contributions to our age. He is most famous for his books "Civilization on Trial," "War and Civilization" and "The World and the West." His most recent work is "A Study of History" which comprises 10 volumes.

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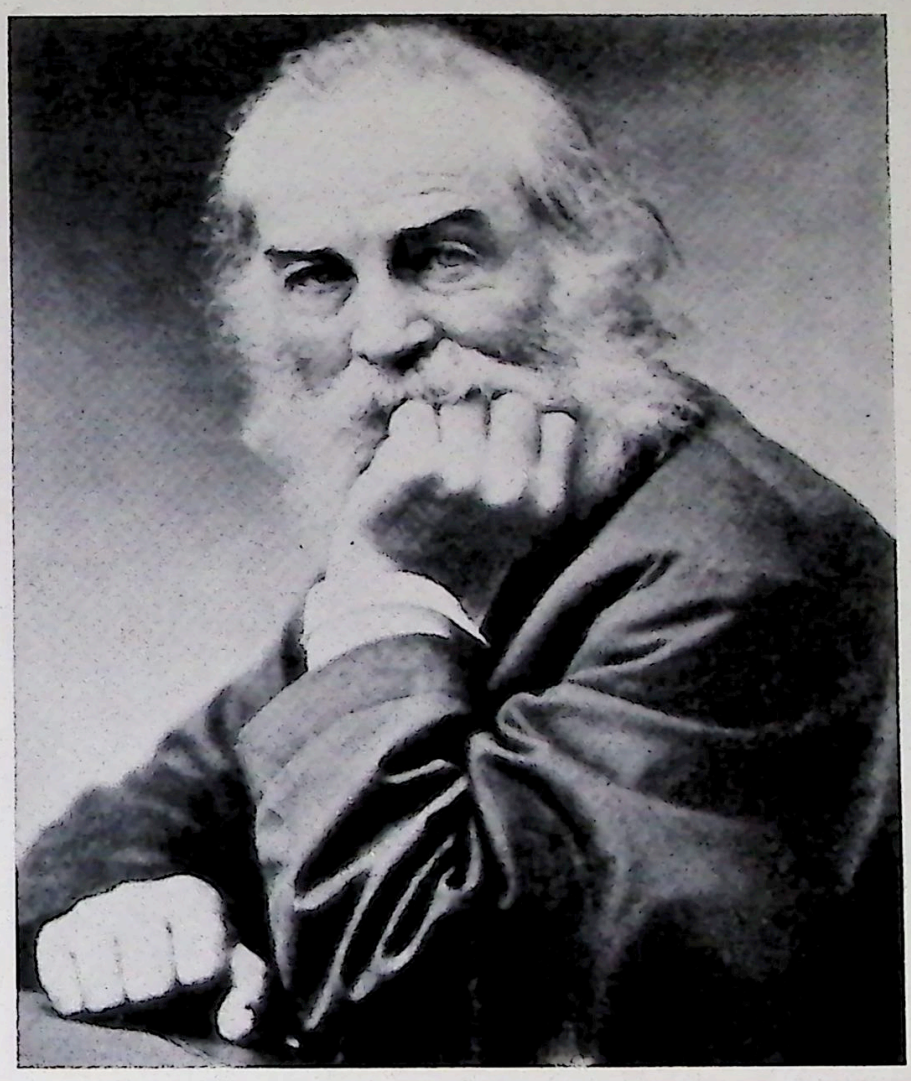
Invitation

TO UNDERSTANDING

by Frederick Mayer

> *Wisdom is of the soul.*—WALT WHITMAN



Walt Whitman

Walt Whitman was the poet of democracy. He believed that greatness was universal and that there was dignity in the little man as well as in the outstanding leader. He felt that democracy was more than a system of government; primarily, it represented a living faith which forever excited the imagination of mankind.

Whitman's basic philosophy was extremely simple. He stressed the goodness of man and the possibilities of the future. There could be no division between spiritual and material ideals, for both were part of the majesty of God. A man of strong faith, Whitman believed that God's power was manifested in all parts of nature. Whitman celebrated the importance of man's senses, especially in his *Leaves of Grass* and he was often attacked for his frankness. His main purpose, however, was not to shock the readers, but to give them a renewed confidence in their own powers and capacities.

All his life Whitman was opposed to formal logic and formal knowledge. He felt that knowledge gave man a false concept of life. *Rules were only pale imitations of reality*. Life had to be experienced under the open sky and had to be lived close to the earth. Reason was only the pathway to intuition.

Whitman's viewpoint has a profound implication for modern man. We tend to be overwhelmed by the rapid march of science and by the awe-inspiring accomplishments of technology. We worship at the shrine of material progress. We forget that what matters most is our own happiness and our own contentment. What is the value of knowledge if it creates torment and agony? What is the value of material advancement if it only makes our life more complicated?

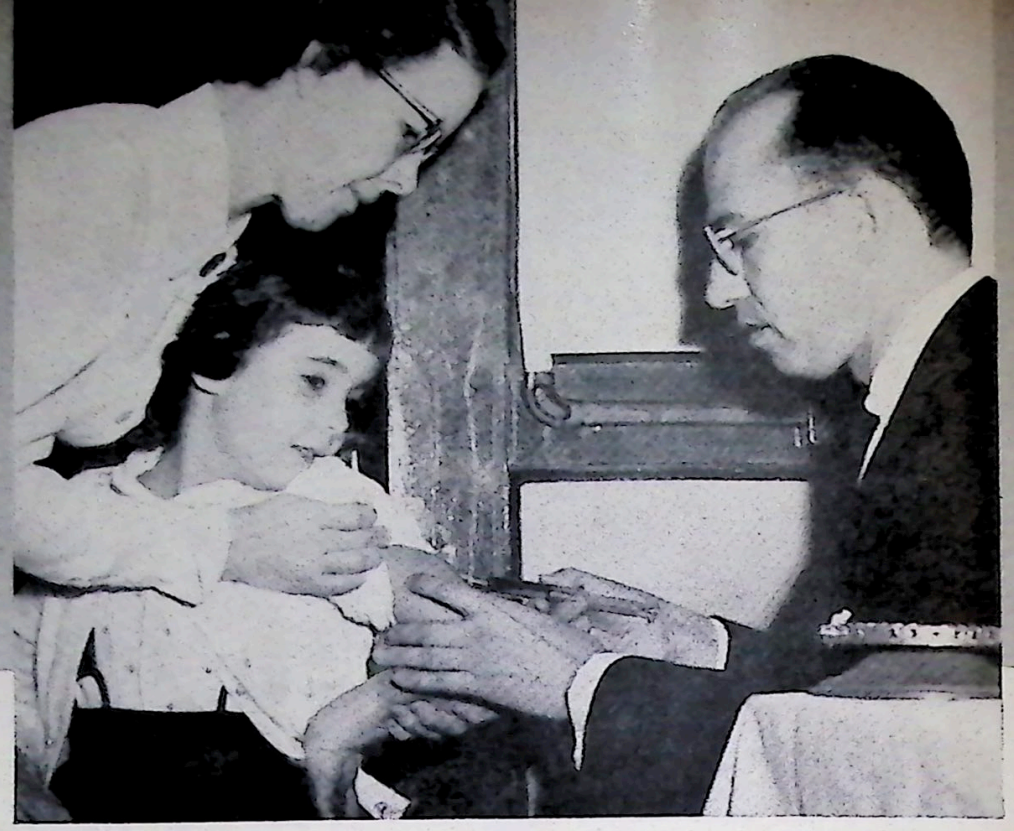
Real progress is of the spirit; it elevates our thoughts; it enchants our heart; it widens our perspective; it overcomes the gulf between us and others. The real drama does not lie in man's domination of nature; rather it lies in his *progressive understanding* of himself.

Become truly aware of thyself and the universe will have a new meaning and a new significance for you! Some may say that their knowledge is inadequate and that their time is limited. They need not give up hope, for wisdom may come to a simple man as well as to the scholar, to the poor as well as to the rich. What is required is the willingness to search, to explore, to remain an eager learner, and to look upon life with enthusiasm and expectancy. Nature speaks to us in a thousand different ways; we only have to open our eyes and listen with intense concentration.

Wisdom can never be defined; it can never be completely analyzed; it can only be experienced. Wisdom is a pilgrimage and an eternal adventure. It is a mirror of man, his failures and his triumphs, his defeats and victories, his tears and his laughter. It is man's search for an abiding purpose; it is his capacity for compassion; it is his bold defiance of time and his unending quest for immortality. ♦

JONAS E. *Salk* M. D.

Medical Researcher



There are two types of medical specialists. There are those who fight disease day and night, who assist mankind in times of despair and agony and who preside over the awesome events of life and death. Others work in the quiet detachment of the laboratory; their names are often unknown to the general public, but their research may have momentous consequences.

Jonas Salk belongs to the second category. Research to him is not a pedestrian pursuit or a routine affair; it is dramatic and exciting, for through it new frontiers of knowledge may be uncovered and disease may be conquered. It is an unending battle which is never completely won, which must be fought by every generation.

Although his discoveries have astounded the world, Jonas Salk is still a relatively young man. He was born in 1914, in New York, the son of a manufacturer. As a boy, he showed unusual maturity and was instinctively drawn to the science laboratory. His teachers at Townsend Harris High School remember him as a youngster with a passion for analysis who was never satisfied with conventional answers. While other students were primarily concerned with social events and athletics, Salk was intensely interested in other things and thoughts.

After high school he attended the College of the City of New York, graduating at the age of 19. He took his medical training at New York University Medical School, where he had to make a decision that he considers one of the most important of his life. At the end of his first year, he was invited by Dr. R. Keith Cannan, professor of biochemistry, to spend one year in the research laboratory. This would mean leaving his class, and adding one-year to his undergraduate term, but he made the decision promptly. After the year in the laboratory, he resumed his studies, graduated, and became an intern at Mt. Sinai Hospital, New York.

In 1947 Salk was invited to head the virus laboratory at the University of Pittsburgh. This was a pioneering venture – the facilities were inadequate and a staff had to be developed. But Salk realized the opportunities to develop his theories and test them in practice, so he plunged into his new work with vigor and enthusiasm.

In his fight against polio, Salk has constantly referred to the contributions in the field of immunology made by such outstanding investigators as Dr. Carl Landsteiner and Dr. Erwin Popper of Austria; Drs. John Enders, Thomas H. Weller and Frederick C. Robbins of Harvard University; and Drs. Howard A. Howe, Isabel Morgan and David Bodian at Johns Hopkins. All the time, the National Foundation for Infantile Paralysis was generous in its donation of funds for his work.

Progress in his research was often slow and occasionally he felt a sense of frustration. Once he even thought of giving up virus research, but as he was sitting in a park and watching children play, he realized how important his work was. There were thousands of children and adults who would never walk again and whose bodies would be paralyzed. He realized his awesome responsibility and so he continued his task with renewed vigor.

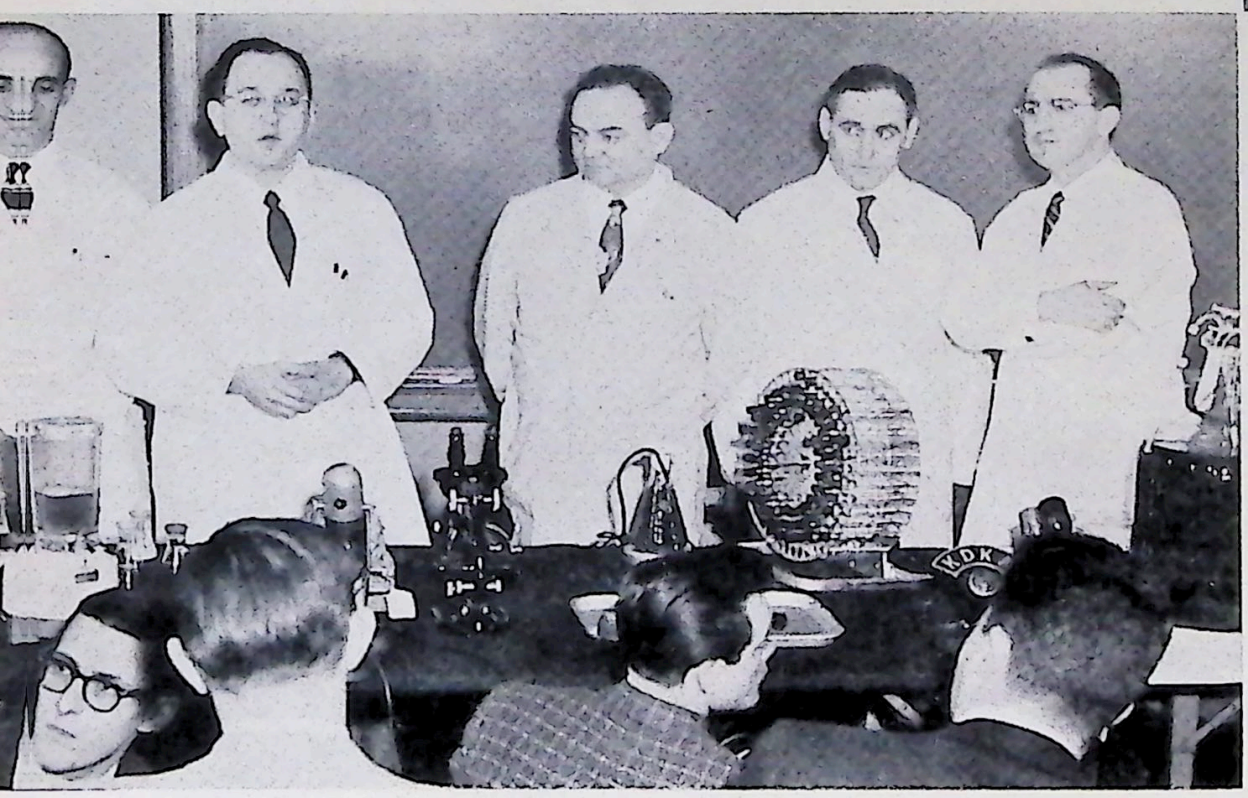
In 1953 Salk reported on progress in studies on vaccination against polio. A year later 1,830,000 school children participated in a program to test the Salk vaccine. When in 1955 Dr. Thomas Francis Jr., at the University of Michigan, announced that the vaccine is 60% to 90% effective in preventing paralytic polio, Salk had made medical history.

Fame and public acclaim have not changed his basic modesty. He works as hard as before, usually 14 or 16 hours a day, and is constantly trying to further understanding of the mechanism of immunity.

In his student days he used to play golf and tennis but now medical research takes all his time. He is especially interested in the problems of mental health, and in that field also he feels that theoretical research will contribute to the solution of pressing problems. He believes that all branches of medicine are interrelated.

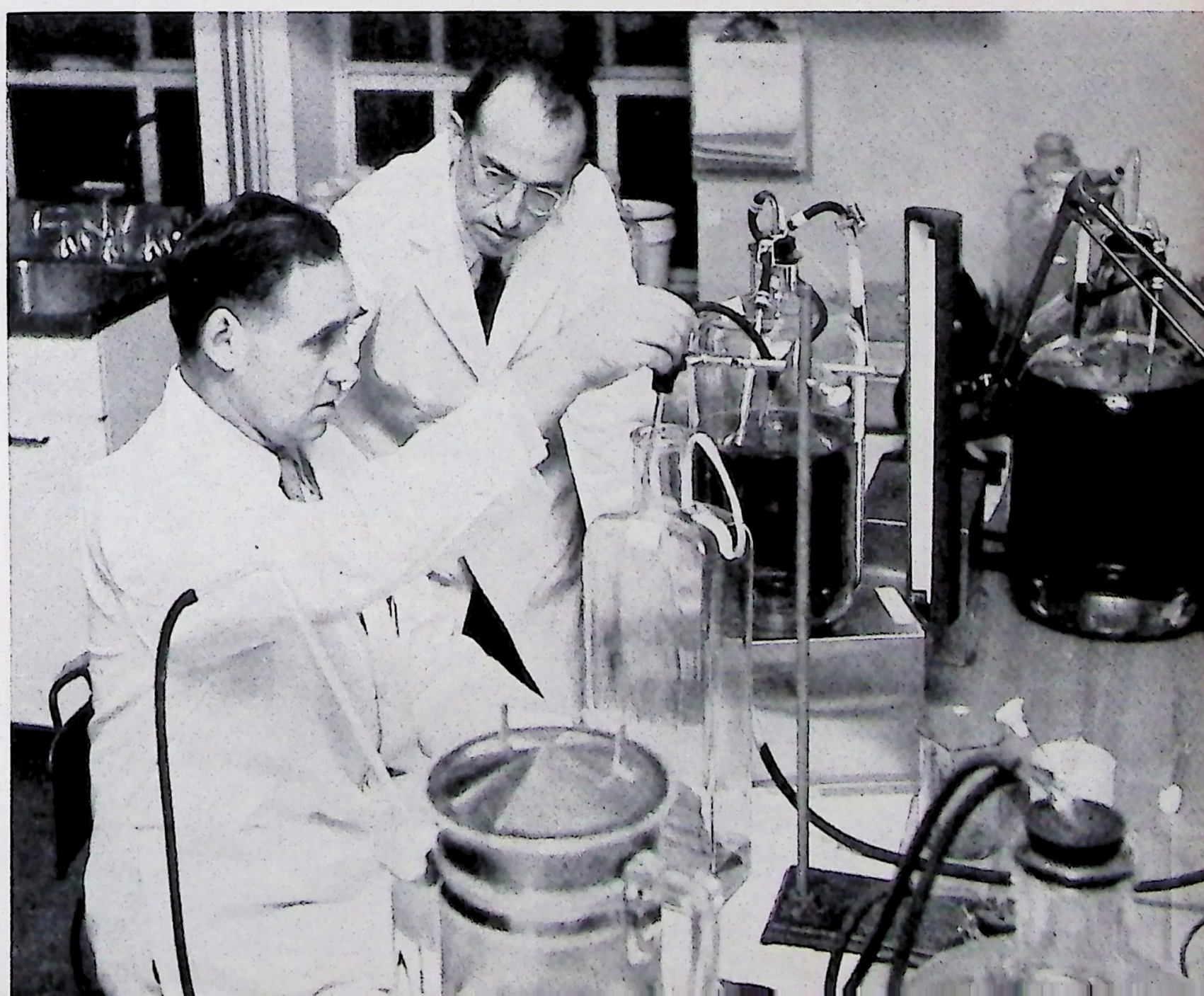
When President Eisenhower expressed the appreciation of the nation to Jonas Salk, he expressed his gratitude to the field of research, to the thousands who work in the isolation of the laboratory so that humanity may live a more abundant life. Like Salk, they labor tirelessly so that where there is sickness there may be health, where there is despair there may be hope, where there is ignorance there may be knowledge, and where there is death there may be life. ♦

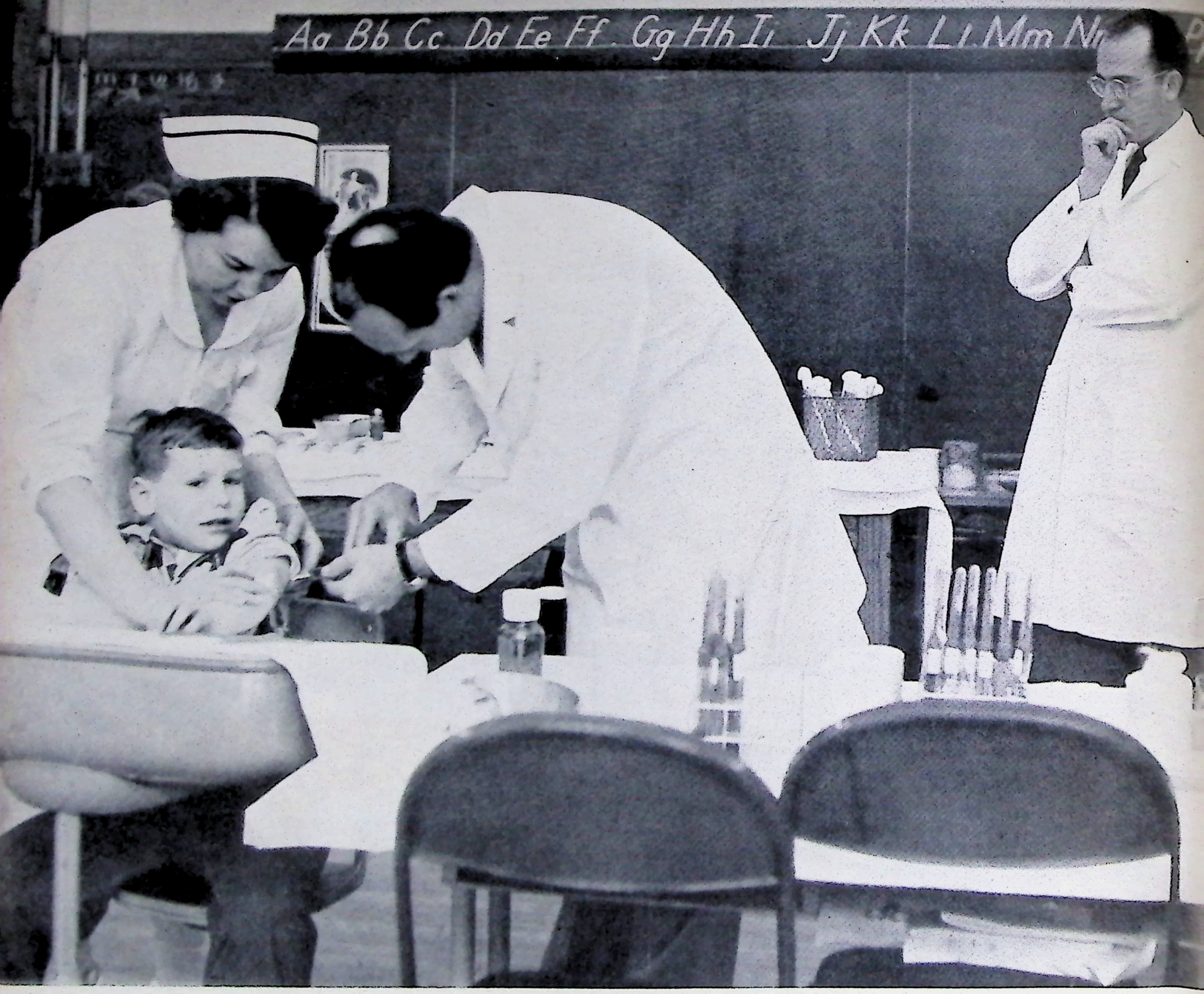
Investigation on vaccination against polio is still in progress. In the Virus Research Labaratory at the University of Pittsburgh School of Medicine, Doctor Salk continues his extensive research to determine the factors for maximum efficiency and effectiveness. It is believed that enough vaccine will be available to the public this year to decrease considerably the number of paralytic polio cases.



The public's need to know of progress in vaccine research has necessitated occasional press conferences. At the one shown here, just before Dr. Francis' report, Doctor Salk and associates answer newsmen's questions. From left to right: Dr. L. James Lewis, research associate; Dr. J. S. Youngner, assistant research professor; Major Byron L. Bennett, research associate; Dr. P. L. Bazeley, research associate; and Doctor Salk.

Polio can be contracted through three types of virus; therefore it is necessary that the vaccine create immunity to all three types. The highest proportion of susceptibles are among children under the age of 15, and pregnant women, who are more susceptible than other women of the same age. If paralytic polio is to be controlled, all of the nation's children should be vaccinated as supplies of the vaccine become available. Here Doctor Salk discusses the vaccine with associate, Dr. P. L. Bazeley.





The Salk vaccine was first tested in the schools with Doctor Salk (right) himself presiding over the inoculations – the first mass medical experiment conducted with the public cooperating. The vaccine is credited with great success, one dose of the three required having made three-fourths of the children inoculated in 1955 immune from paralytic polio. The government has appropriated $30,000,000 to provide free vaccinations for all children through 14 years of age. Demonstration of the effectiveness of the Salk vaccine has spurred research in other diseases caused by viruses.

Polio Highlights: 1789-1956

1789—Polio first described by Michael Underwood, a British physician, who asked other doctors "to pay attention to it."

1840—Dr. Jacob Heine, German bone specialist, learned that symptoms of polio result from damaged or destroyed nerve cells.

1890—Dr. O. Medin gave comprehensive description of symptoms and called polio an infectious disease.

1908—Drs. Karl Landsteiner and Erwin Popper in Austria showed that polio may be transmitted to the monkey, thus giving scientists an experimental animal in which to study the disease; they subsequently showed that polio is caused by a virus.

1927—Franklin D. Roosevelt, a polio victim, founded the Georgia Warm Springs Foundation, first institution exclusively for polio with Basil O'Connor as one of its founding fathers.

1938—National Foundation for Infantile Paralysis incorporated "to lead, direct and unify" the fight against polio.

1939—The first of 3,100 local chapters of the National Foundation formed in Coshocton, Ohio, on May 12. Dr. Charles Armstrong, of the U. S. Public Health Service, discovered that the Lansing strain of polio may be transmitted to cotton rats.

1945—National Foundation appropriation of $1,267,600 made for expanded program of professional education to relieve critical shortage of physical therapists.

1949—Drs. John F. Enders, Thomas H. Weller and Frederick C. Robbins of Harvard found that polio virus may be grown in cultures of non-nervous tissue in test tubes. This discovery paved the way for growth of the virus in quantities massive enough for use in a vaccine.

1951—Research costing $1,190,000 in March of Dimes funds determined that all known strains of polio virus can be classified into three broad types. This showed that a successful vaccine would have to immunize against all three types of virus.

1952—Dr. William McD. Hammon of the University of Pittsburgh showed, through the use of the blood derivative gamma globulin, that relatively small amounts of antibodies in the human blood stream can protect against paralytic polio.

1953—Dr. Jonas E. Salk of the University of Pittsburgh reported hopeful results in preliminary vaccine investigations involving the inactivation of the polio virus with formalin.

1954—In the largest medical field trial in U. S. history, 1,830,000 school children participated in a program to evaluate the Salk vaccine.

1955—On April 12, Dr. Thomas Francis Jr., of the University of Michigan announced that the vaccine as used in 1954 was 60 to 90 per cent effective in preventing paralytic polio. This degree of effectiveness was observed with but one dose of the vaccine available in 1955.

1956—The fight against polio goes on.

Secretary of Health, Marion Folsom (right), presents a gold medal by Congress to Doctor Salk, as he is honored for his research and development of the vaccine. Congressman Irwin D. Davidson (center) holds a copy of the document and the pen used by President Eisenhower to sign the resolution into law. Doctor Salk has been presented with numerous honorary degrees from colleges and universities throughout the country, but thus far has gone to receive only those conferred by the institutions with which he was associated. In addition to the highest award of the Guatemalan government, he has also received the French Legion of Honour, an award which was also made to Madame Curie for her work with radium.

In recent years Salk has spent what little leisure time he has had with his family. Daily attention to his work is sometimes 16 hours long, and at times has been seven days a week. Sundays – but even these have been curtailed in the past three years – he spends with his wife, Donna Lindsay Salk and sons Jonathan, 6; Darrell, 8; and Peter, 12 (standing). They were among his earliest subjects for testing the polio vaccine.

The Story Behind the *Polio Vaccine*

On Tuesday, April 12, 1955, Dr. Thomas Francis Jr. of the University of Michigan, speaking at a scientific meeting in Ann Arbor, reported that the vaccine developed by Dr. Jonas E. Salk and his associates was 60-90 per cent effective in preventing paralytic polio in 1954.

In summarizing his 111-page findings, Dr. Francis placed greatest emphasis on figures from placebo areas—parts of the country where the vaccine was tested by administering it to one group of children, and giving a similar group injections of a neutral fluid known to have no effect.

In these areas, considering polio cases that were confirmed by laboratory examination, Dr. Francis found the vaccine 60 to 70 per cent effective against Type I polio and 90 per cent or more against Types II and III. It developed that some of the vaccine included in the field trial had been weakened by the action of merthiolate, a preservative that is added to the vaccine. Since means have been developed to avoid this effect, vaccines manufactured for use in 1955 and subsequently are believed to be more effective than those made for the field trial.

Dr. Francis' study – by far the most extensive ever given any vaccine – revealed that the Salk vaccine, properly manufactured and tested, was extraordinarily safe. As had been predicted, it was effective in preventing *paralysis* due to polio. It had no significant effect in preventing minor, transient illness, resembling non-paralytic polio—illness due to viruses other than the polio virus.

The evaluation report, involving the analysis of over 144 million facts on machine records cards, was a milestone in the long fight against a disease that must have existed at the dim beginning of recorded history.

General public interest in polio in the United States had its beginnings during the epidemic of 1916, but it was crystallized by Franklin D. Roosevelt, who was stricken by polio in 1921 and learned so well to live with his handicap that he was able to serve in the nation's highest elective office. It was he who founded the National Foundation for Infantile Paralysis in 1938 to lead, direct and unify the fight against the disease.

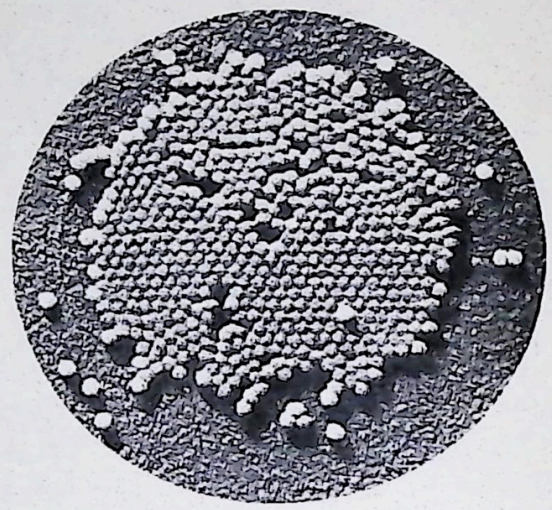
It was certainly a fight that needed direction, for there was no concerted plan of action; although some brilliant research was being conducted, there was no system for pulling together available information, and no blueprint for the future.

Before the National Foundation was established, it was known that polio was an epidemic disease that affected more children than adults.

It was known that a child who had recovered from polio was apt to be immune in the future, but there *were* instances of the same person having the disease twice.

It was known that the cause of the disease was a virus.

Almost everything else about polio was extremely cloudy. Scientists were not sure how the virus entered the body nor where it came from. The virus had been found in a good many places, in some insects, in sewage, once in a well in Sweden. Cleanup projects of various sorts produced no noticeable results.



MEF-1 strain of Type II polio virus enlarged about 180,000 times

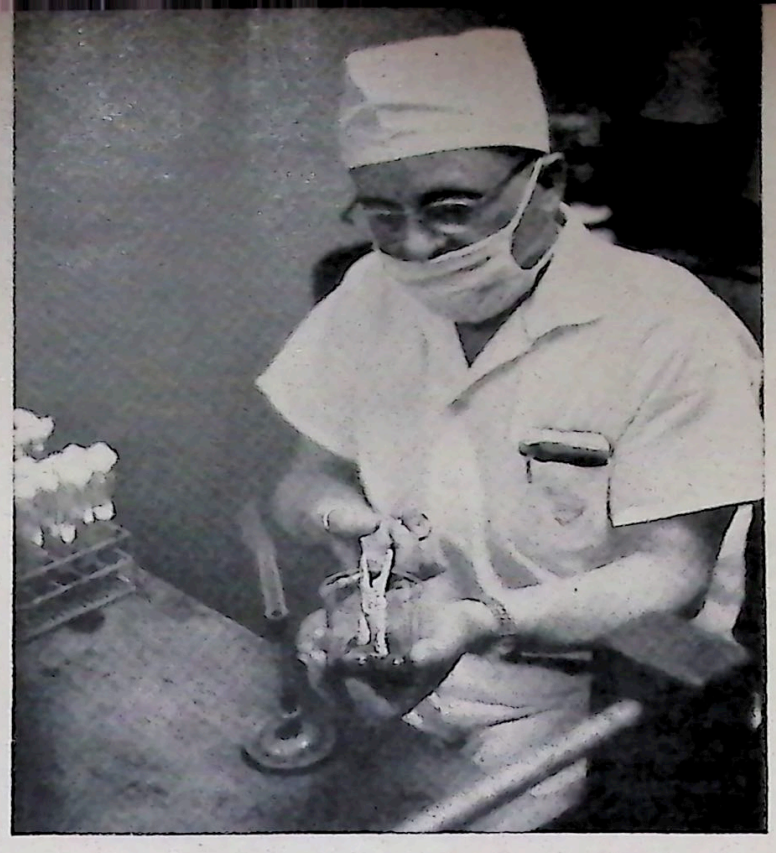
With the formation of the National Foundation and the support that came from its annual March of Dimes, the American people became shareholders in the fight against polio. From this time on, in dozens of research projects, in hundreds of exchanges of scientific information, in scores of community projects, there developed wholly unprecedented teamwork between the public and the world of medicine.

If one had studied the vaccine evaluation program in detail, he would have found almost every branch of society represented. He would have found industry turning out special equipment, universities conducting scientific studies, laboratories performing hundreds of tests, public health nurses on their days off tracking down single pieces of information necessary to the program. He would have found a physician many miles from the nearest field trial area taking special pains to send by air mail a blood sample taken from a child in the vaccine program.

One of the most important steps undertaken by the National Foundation soon after it was established was to gather and outline exactly what *was* known about polio. Then it became possible to know in what direction to move. Progress toward an answer to polio gained momentum after 1938, moving slowly at first, but gathering speed with the aid of March of Dimes funds and fundamental advances in research.

The money the people gave made many things possible. Scientists and physicians were specially trained in the techniques needed for this kind of research; additional researchers were recruited to lend their talents to the work; laboratories were set up and equipped for the specialized work that might find an answer to paralytic polio. And the money also provided monkeys for research.

The monkey was the basic experimental animal for studying polio. Some impressive early work was done with cotton rats and later with mice, but monkeys were the animals of choice. They had to be imported from Asia at great cost. Before 1938, many soundly conceived projects failed to achieve their full possibilities largely because there was so little money for purchase of monkeys.



The virus is grown in cultures of monkey kidney tissues. Kidneys are removed aseptically from healthy rhesus monkeys (from India), then minced and mixed with a synthetic nutrient to foster maximum growth of the tissue. More than 50 chemicals are contained in the nutrient mixture. It has been found that the monkey is the most practical primate to be used for this purpose, and is relatively inexpensive, despite shipping costs.

Such monkeys as were available were often below acceptable standards for medical research.

Money contributed to the March of Dimes made it possible for the first time for investigators to have enough monkeys to perform necessary studies. However, there was still the problem that many of the monkeys obtained through the usual channels were unsatisfactory and unhealthy. To meet the need, the National Foundation established, and still maintains a monkey farm at Hardeeville, S.C. Tens of thousands of animals have been processed through this farm, each one of them carefully and repeatedly examined for any sign of illness. Monkeys from this farm are vital to the vaccine program.

Fighting a disease like polio sounded simpler than it was. Scientists knew that it was caused by a virus, so at least the target was known. But much more information was needed.

By the late 1940's it was apparent that scientists were dealing with more than *one* virus capable of causing polio. Some experimenters were working with one strain, some with another. It became clear that immunization as a result of recovery from one strain might not protect an individual from the others.

It was at this point that *direction* of the fight against polio began to have special meaning. For the National Foundation began a project to determine just how many kinds of polio virus there were.

It took coordinated work by four different university laboratories, using 17,500 monkeys and $1,190,000 to find the answer, but it was an answer that was a keystone of all future research toward polio prevention.

The answer was that all known strains of polio virus could be classified into three types. If you were infected by a strain of one type, you were henceforth protected against any other strain of that type. But you weren't protected against strains from some other type.

This meant that any successful vaccine would have to be designed to protect against three different viruses; it was almost like preventing three diseases, though their symptoms were all the same.

In 1949 Drs. John F. Enders, Thomas H. Weller and Frederick C. Robbins of Harvard University found a way to grow polio virus in non-nervous tissue kept alive in flasks and test tubes. The discovery was one of the great achievements of polio research and brought the three scientists the 1954 Nobel Prize in Medicine and Physiology.

Now there was a *practical* means of growing polio virus suitable for use in a vaccine. Small quantities had been grown earlier on bits of nervous tissue, but virus cultivated in this manner is considered unsatisfactory for use in a vaccine.

The discovery by Dr. Enders and his associates led to work by other investigators, resulting in present-day methods for mass producing the polio virus needed for the manufacture of vaccine. In addition, the research of the Harvard scientists brought about the development of numerous laboratory tests for polio in which a few test tubes of tissue culture can replace costly live monkeys.

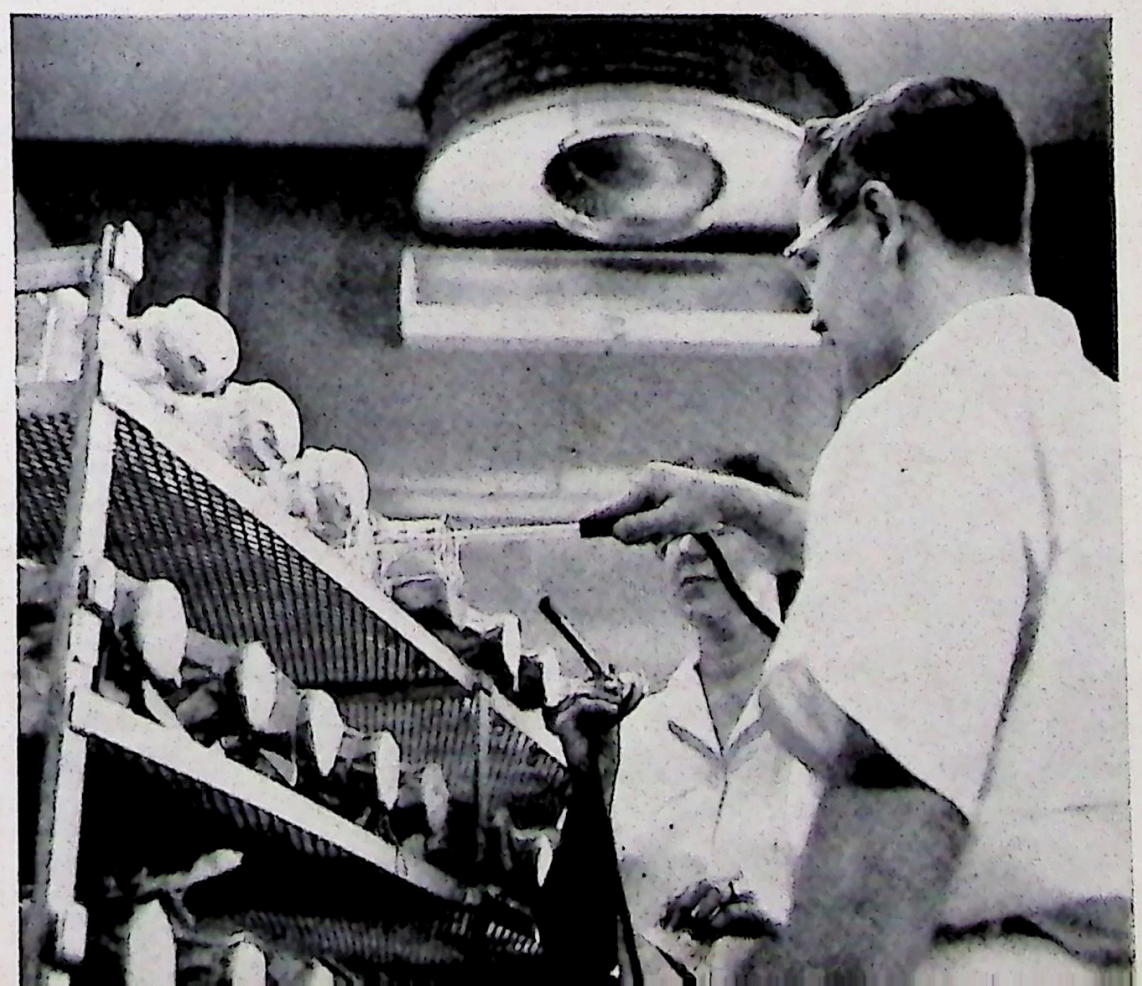
Prior to 1952 polio virus had only been found twice in the blood stream of polio patients. In that year, however, researchers at Yale University and The Johns Hopkins University (Dr. Dorothy Horstmann and Dr. David Bodian) found polio virus circulating for brief periods in the blood of monkeys and chimpanzees. Later additional evidence was uncovered that polio virus may be present in the blood of human beings prior to the onset of illness. This finding suggested a logical explanation for the observation of Dr. W. McD. Hammon of the University of Pittsburgh, who had found that small amounts of polio-fighting antibodies contained in gamma globulin from human blood could confer temporary protection against the disease.

What are antibodies? They are modified normal protein referred to as the gamma globulin fraction of the protein in the blood. Modification is the body's response to infection or vaccination.

How do antibodies protect? In some manner they unite with the virus preventing it from entering the cells. If, as a growing body of research seemed to suggest, polio virus appears in the blood of those infected, one way to prevent paralysis might be to prevent the virus from entering the blood and thus prevent invasion of the nervous system.

Dr. Hammon gave antibodies to individuals by injecting gamma globulin obtained from the blood of other people and known to

Cultures are gently rocked in large bottles for an incubation period of six days. This keeps the tissue alive and growing. Then the nutrient is replaced by fresh medium containing live virus of one of the three polio strains. Each of the strains has to be grown separately. Next, the virus-infected tissue is placed back in the incubator for four more days during which time the virus multiplies. The virus-containing fluid is then passed through filters of increasing fineness. Constant tests are carried on throughout the process to insure proper virus content.



Hundreds of culture tubes containing tissue that has already been inoculated with virus, plus a nutrient solution, are placed in drums which rotate at 10 to 12 revolutions per hour. This insures that the tissue will be evenly bathed by the nutrient solution, as the virus is propagated. Temperatures are kept at 95° to 96° Fahrenheit during an incubation period of seven to eight days.

contain the antibodies. The antibodies thus conferred were a sort of short term loan. They lasted from six to eight weeks, then gradually were gone. What was still needed was something that would make human beings create their own antibodies that would persist.

One material was known which was capable of stimulating the human body to produce polio antibodies. This material was the polio virus itself. And this virus, of course, could also produce paralysis or death.

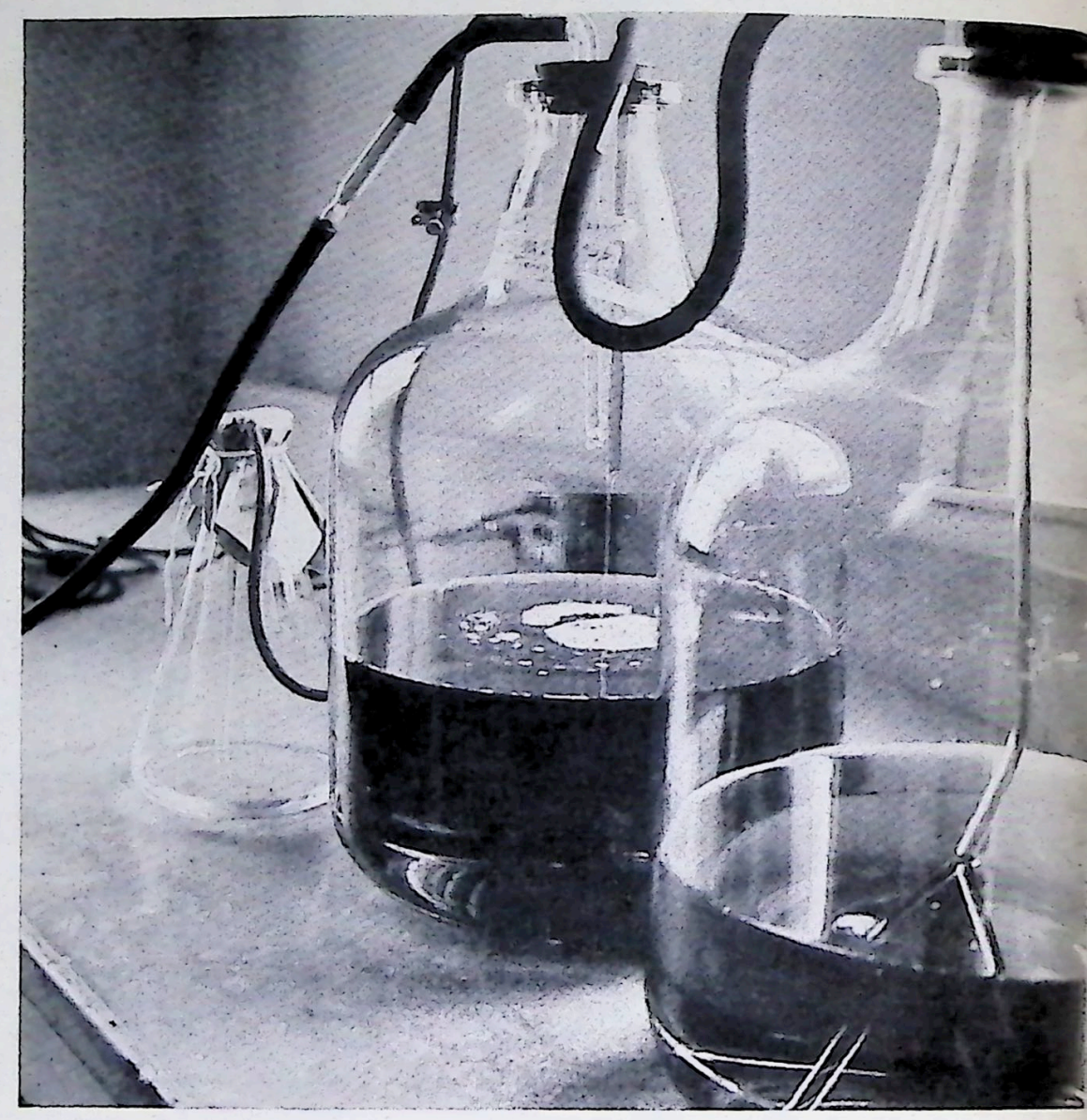
At the University of Pittsburgh, however, Dr. Salk and his associates set out to test the principles of immunology which had been demonstrated to be helpful in the control of other diseases. This field of research dates back to Jenner and Pasteur, and the specific work done in polio investigation during the past 50 years would disclose a list of medical researchers whose contributions could only inadequately be acknowledged here.

Salk and has associates tried to dissect the factors involved in immunity and to determine the principles that govern convalescent immunity as compared with immunity induced by a killed-virus vaccine. They also strove to determine the quantitative factors of importance for killing the virus without loss of immunity-producing power.

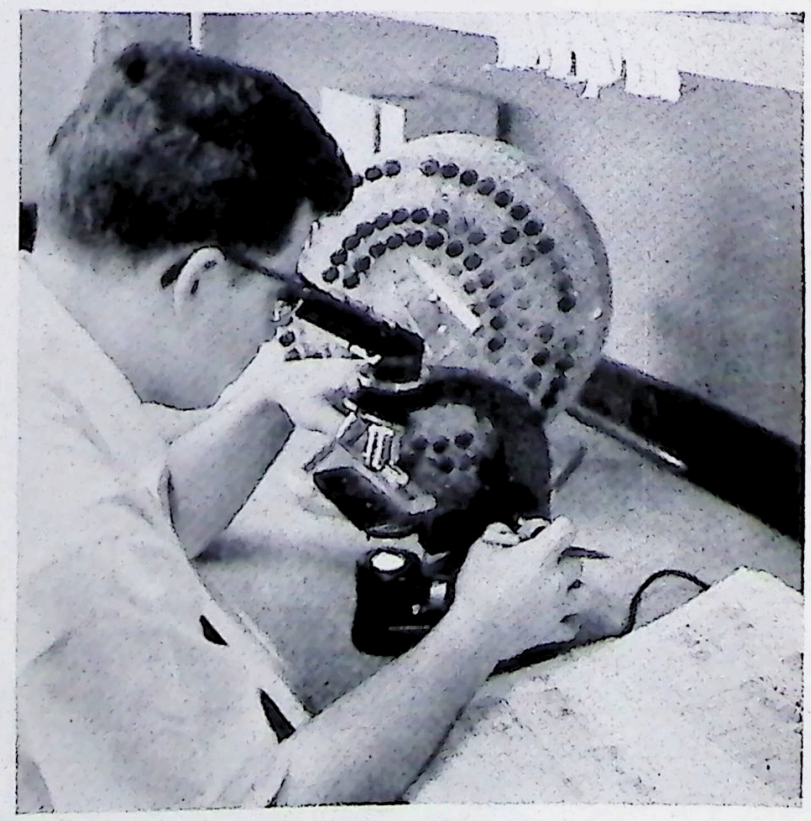
The result of painstaking application of this concept is the Salk vaccine used in national field trials in 1954. It consists of the three types of polio virus, treated with a solution of formaldehyde to make them harmless. When injected, the vaccine induces the human body into setting up a defense against such invasion by producing antibodies. Dr. Salk's tests in Pittsburgh showed that antibody levels rose – the field trial and evaluation showed that the vaccine prevents paralytic polio.

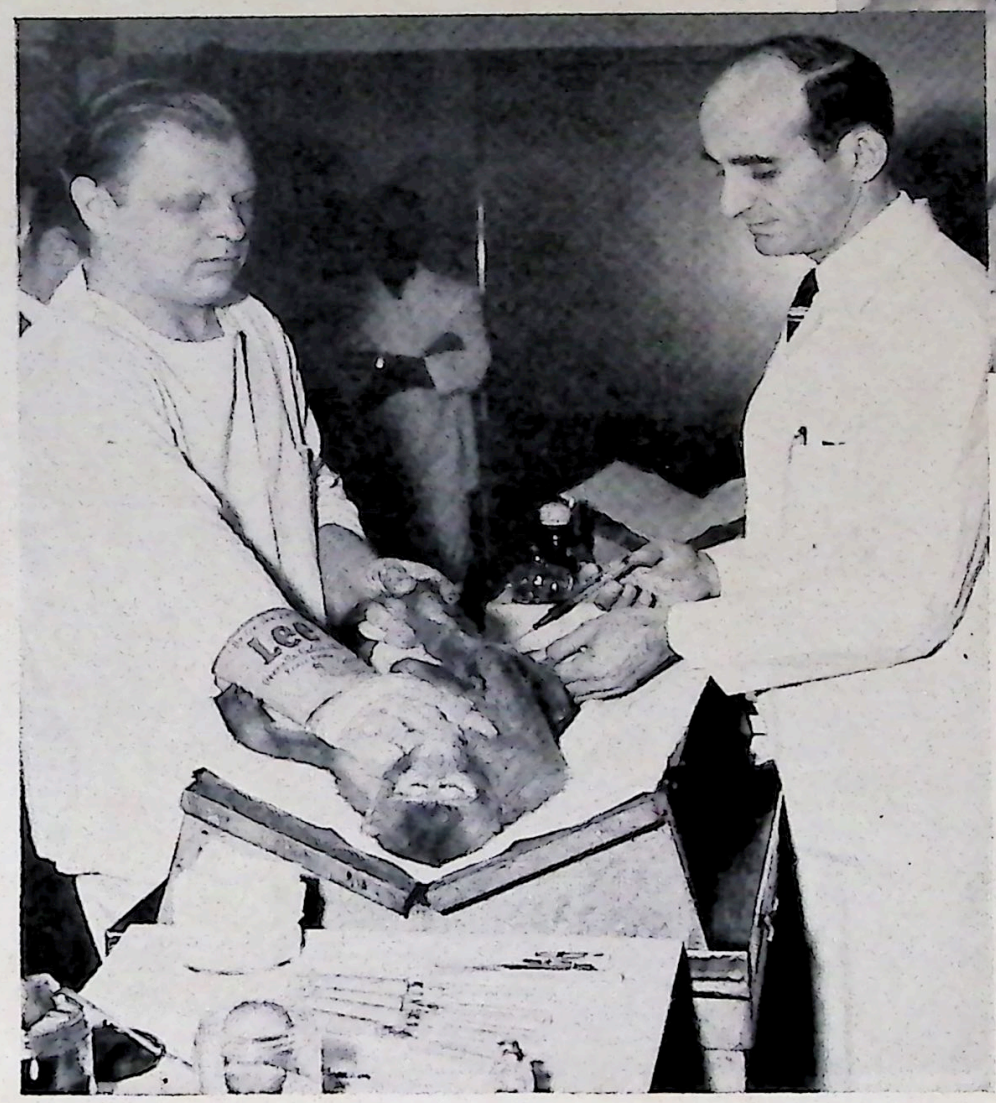
The field trial of the Salk vaccine consisted essentially of three parts:

"Killing" the virus is an exacting process. After tests for virus content and for absence of contamination with unwanted viruses, live polio virus must be "killed" with formaldehyde, before the strains are mixed. Liquid shown here contains "killed" virus.



After the "killing" of the virus, the inactivation agent is neutralized. The vaccine is then tested by tissue culture to detect any live virus remaining within the solution.





After the virus has been "killed" with formaldehyde, the virus becomes a vaccine. It has already been subjected to many tests, but before it is ready for use in human inoculation, it is again rigidly tested in the laboratory. Cynomolgus monkeys from the Philippine Islands, or rhesus monkeys from India, can be used for test injections (at left) to determine the final vaccine's effectiveness. Kidneys from rhesus monkeys (like those shown above) are the ones principally used for growing polio virus.

(1) Vaccination of a sufficient number of children and the establishment of suitable control groups of unvaccinated children.
(2) Collection of information on all of these children, both before and after the vaccination period, and through the polio season, with special information on children in the study group who develop polio.
(3) Analysis of all information received.

The first part of the program was completed in July of 1954; the second part was almost completed by December 31, 1954. The third resulted in the report by Dr. Francis on April 12, 1955.

The vaccine was given to 440,000 children in the United States. Reactions were extremely infrequent and, in general, of little significance. Another 210,000 youngsters received one or more injections of placebo – a substance that looked like the vaccine but was known to have no effect. More than 1,180,000 additional children received no injections of either placebo or vaccine but participated in the study by serving as a control group. Forty-four states joined the field trial. More than 300,000 persons, including physicians, public health officials, nurses, schoolteachers and National Foundation volunteers helped to carry it out. Pharmaceutical manufacturers cooperated in producing the vaccine that was used.

The field trial was an extraordinary medical undertaking, and was probably even more remarkable as an experiment in human relations. Rarely have so many different community groups joined in so broad a project for the public good.

Educational authorities, always overloaded with duties near the end of the school year, made available space for vaccinations to be administered, while teachers joined volunteers in routing children for their "shots." Many who helped with vaccinations in the spring served again during the summer, checking records to be sent to the Evaluation Center at Ann Arbor.

The vaccination program brought health officers, the public, and the medical profession into close contact. Each group was enabled to understand a little better than before the problems and objectives of the others. Typical comment: "The field trial was a tremendous job, but it was worth it in community understanding, above and beyond its value in the fight against polio."

Helping to evaluate the effect of the vaccine were 27 research laboratories from coast to coast and from Canada to Louisiana. They performed tests on blood samples from youngsters who participated in the field trial. The tests determined antibody levels before and after vaccination, and at the end of the polio season. Special studies also were conducted in these laboratories on blood samples and other materials obtained from polio cases which occurred in the study population.

In many instances, state health officers, who were responsible

for the injection phase of the field trial, also aided in the evaluation through the collection of blood samples, fecal samples, and other pertinent information on participating children.

The evaluation of the vaccine was supported by grants from the National Foundation to individual laboratories, and by grants of $900,000 to Dr. Francis at the University of Michigan.

The polio vaccine developed by Dr. Salk consists of each of the three types of polio virus, treated with a formaldehyde solution to make them harmless. The vaccine is red in color.

To make the vaccine, the three types of polio virus are grown on small bits of monkey kidney tissue, nourished by an extremely complex fluid called Mixture 199. The fluid keeps the cells alive so the virus can multiply within them.

Under extremely exacting conditions of temperature and general agitation, the virus multiplies and, after three to five days, is harvested. The fluid is poured into suitable containers and filtered.

To the virus-containing fluid is added a solution of formaldehyde, a chemical capable of inactivating the virus. The formaldehyde is later neutralized with sodium bisulphite.

While the formaldehyde is in contact with the virus, it removes its ability to cause disease. The virus does retain the property of being able to stimulate the human body into producing antibodies to poliomyelitis.

To make sure that no particles of live virus remain, samples of vaccine are injected directly into the central nervous systems and into the muscles of a number of healthy monkeys. These animals are observed for almost three weeks. Should the vaccine cause any sickness in these animals or should there be any evidence of infection in the animal, that lot of the vaccine is discarded.

As a further check, quantities of vaccine are added to living cells growing in test tubes under controlled conditions. Should there be any sign of the virus growing or attacking these cells, the vaccine is discarded.

Finally, samples of the vaccine are injected into mice, guinea pigs and rabbits to see if there are any substances other than the polio virus which might cause a harmful reaction.

Safety tests on each batch of vaccine are conducted with rigorous care by each manufacturer. In addition, however, the Division of Biologics Standards of the National Institutes of Health of the U. S. Public Health Service, conducts further careful checks before any lot of vaccine is released for use. Testing requirements may be changed by the Public Health Service as it deems necessary.

From 1938 to the end of 1954, $203,600,000 has been spent for financial assistance to polio patients who needed help, making possible the best available care for all those who could not meet the costs themselves without undue hardship. Such aid is given through the 3,100 Chapters of the National Foundation covering every county of the United States.

Beyond the financial outlay, however, National Foundation support has meant nationwide, even international intensification of the effort to control polio. Many people – at universities, in laboratories, in medical schools, hospitals and clinics – have been able to step up their activities, improve their techniques, undertake projects both scientific and clinical that were not possible before the American people created the means for supporting such efforts.

The International Poliomyelitis Congress, established in 1948, has held three international conferences at which distinguished scientists from all over the world have reported on their work, sharing knowledge of advances and providing inspiration for future progress.

Were it not for the accomplishments of thousands of men and women in all parts of the United States and many parts of the world, the present hopeful period in the fight against polio could not have been achieved. ♦

Large stainless steel bottles are used to mix the three strains of poliomyelitis vaccine, which is then siphoned into the 20-liter bottles shown on the shelf. Each of the smaller bottles contains approximately $40,000 worth of polio vaccine.

Even with the laboratory tests for potency and the successful record of the vaccine to date, spot checks are still made to see if it has had the desired effect. At certain intervals blood samples are drawn from inoculated individuals and analyzed in the laboratory. Here blood serum from a vaccinated person is being transferred to a test tube. An analysis will be made to determine the amount of antibodies created by the vaccine.

Questions and Answers ABOUT THE POLIO VACCINE

Is there a risk to vaccination?

No. The virus in the vaccine has been killed and there is no danger of contracting polio from the vaccine. Stringent tests for safety are required by the U.S. Public Health Service on every lot of vaccine released. There *is* a risk of falsely attributing to the polio vaccine, in the case of persons who have been vaccinated, illnesses or diseases caused by virus infections other than polio.

How long does it take for the vaccine to protect?

Three injections are suggested for full protection. The first shot *begins* to take effect from seven to ten days later; at that time, detectable antibodies are present in the blood stream. The second shot, two to six weeks after the first, brings a further rise in antibodies. With these two injections, almost all children should be protected against paralytic polio, further assurance and long-lasting immunity developing after a third or booster shot, given seven months to a year later.

Can a vaccinated child become a polio carrier?

Yes, but not because he is vaccinated. *Anyone,* vaccinated or unvaccinated, may harbor the polio virus and pass it on to someone else. The vaccine protects against paralytic polio; it may, but is not intended to, prevent the virus from setting up an infection in the human body.

What is meant by "provocation"?

It has been found that certain kinds of injections during the polio season have a slight tendency to provoke paralytic polio, with paralysis occurring in the arm injected if the individual concerned is already incubating the disease. The nature of this phenomenon is not wholly understood.

Should the vaccine be given during a period of rising polio incidence?

Yes, because the protection it affords is greater than theoretical risk of provocation. This was the decision of 26 physicians, health officers and virus experts who met with National Foundation medical advisers on June 18, 1955. The benefit to be gained by polio immunization increases as polio incidence rises, they said, since under such conditions a larger number of paralytic cases can be prevented.

How long does it take for polio to incubate?

From three to 35 days, but generally about two weeks. When a person is vaccinated, his body begins to develop polio antibodies. If he is vaccinated *after* he has been infected by the polio virus, however, one cannot expect protection from paralysis.

Can everyone produce antibodies?

Yes—except persons who have a condition known as agammaglobulinemia, a rare disease in which a person cannot produce antibodies of any kind. Some people, however, are better antibody producers than others.

Are there times when the vaccine should not be used?

Yes. It should not be given to anyone who is ill at the time, especially if there is fever, sore throat or a gastro-intestinal upset. The decision as to using the vaccine rests, of course, with the family physician.

How long does protection last?

There hasn't been enough time since the vaccine was developed to answer this question fully. Youngsters who received the first experimental vaccine in Dr. Salk's research program in 1953 still have protective levels of polio antibodies. The decline in amount of antibodies following the third or booster shot of vaccine, however, is so slow that the vaccine's effectiveness is expected to last for many years. Only time and further investigation can give the complete answer.

If the second shot is delayed, will it be effective?

Yes. According to Dr. Salk, the effect of the first shot is not lost even if the second shot cannot be given for many months afterward. A third or booster shot should be given about seven months after the second injection.

Does the first injection itself protect against paralytic polio?

In 1955, when but one dose was given to most children, almost four-fifths of those inoculated developed immunity against paralytic polio. One injection sets the machinery in motion for antibodies production, reduces a child's *chances* of developing paralytic polio. Two shots are needed for those who do not respond to the first dose—and three for those in whom the first or second did not take and for further enhancing the level of antibodies.

Should people who have had polio be vaccinated?

Yes. There are three types of polio virus and a person who has recovered from infection by one type is not necessarily immune to the other two.

Does the vaccine prevent non-paralytic polio?

Yes, as was found to be true in a high proportion of cases in 1955. Where non-paralytic polio had been diagnosed or reported, evidence indicated the illness was not due to polio virus infections but to some other virus.

Is a dangerous virus used in preparation of the Salk vaccine?

All vaccines and nearly all drugs are made from material that is potentially dangerous, but these materials are refined or treated until they are not dangerous when given in recommended dosages. The Mahoney strain of polio virus, used in the polio vaccine, is—before treatment with formaldehyde—a virulent strain. When properly inactivated for use in the vaccine, however, it will not cause any illness.

Is the vaccine being used outside the United States?

Yes—in Canada and in Denmark. Vaccine has been made in these countries according to Dr. Salk's formula. A number of other countries plan to manufacture it.

What research still is needed in the vaccine field?

March of Dimes research is continuing to find how long vaccine effects last, to determine the best times and sizes of doses for long-lasting protection and to find whether or not booster shots are needed for maintaining immunity. Also, experiments are under way to find more readily available and possibly less expensive cells than monkey kidney tissue in which virus for vaccine may be grown.

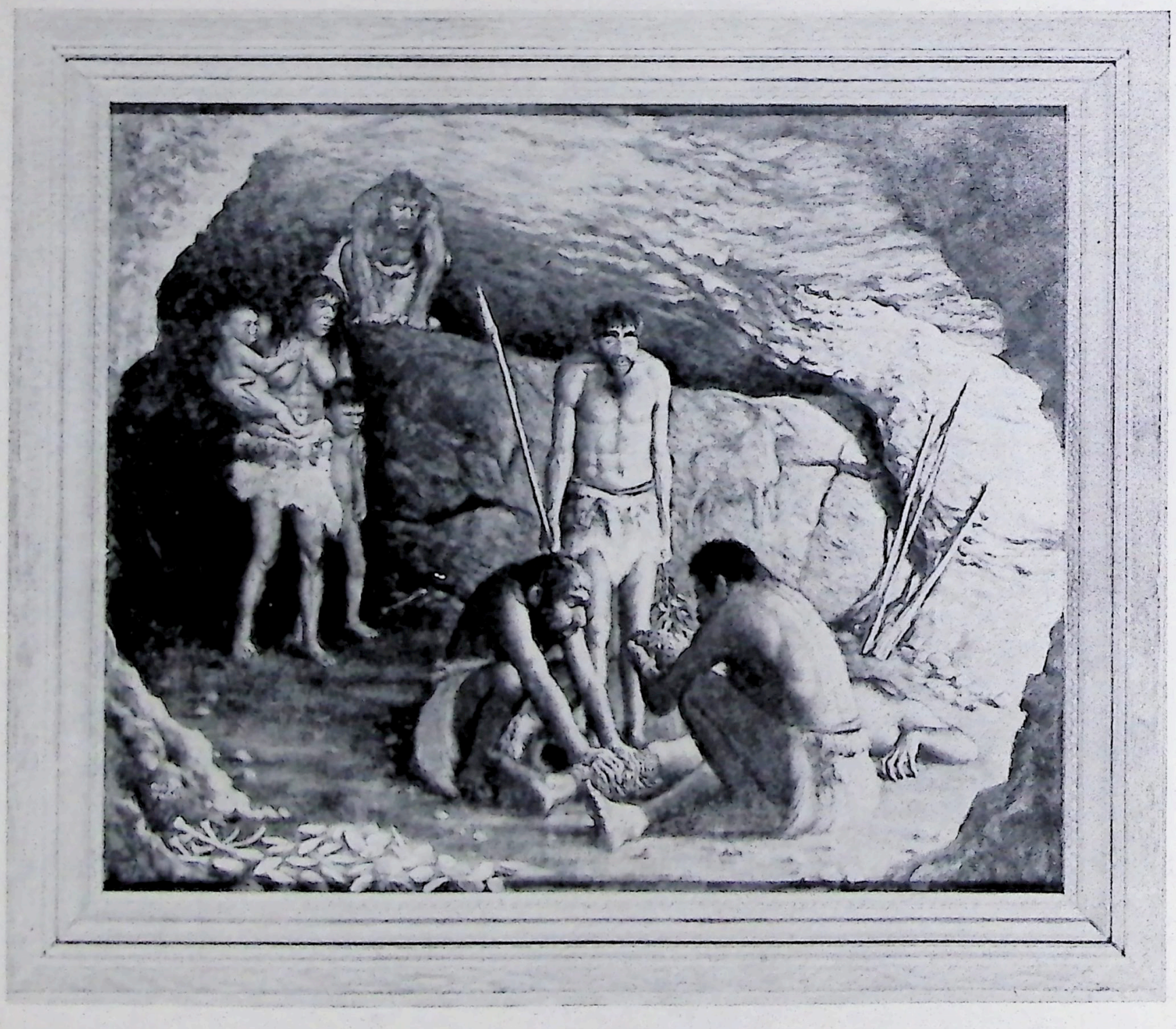
Is polio controlled yet?

No. But we now know that its control is feasible. When supplies allow vaccination of all those in the most susceptible groups, we should see a diminishing rate of paralytic polio. The National Foundation will continue its research and professional education programs, and must continue to provide care for the many patients for whom the vaccine came too late.

History of *Pharmacy*

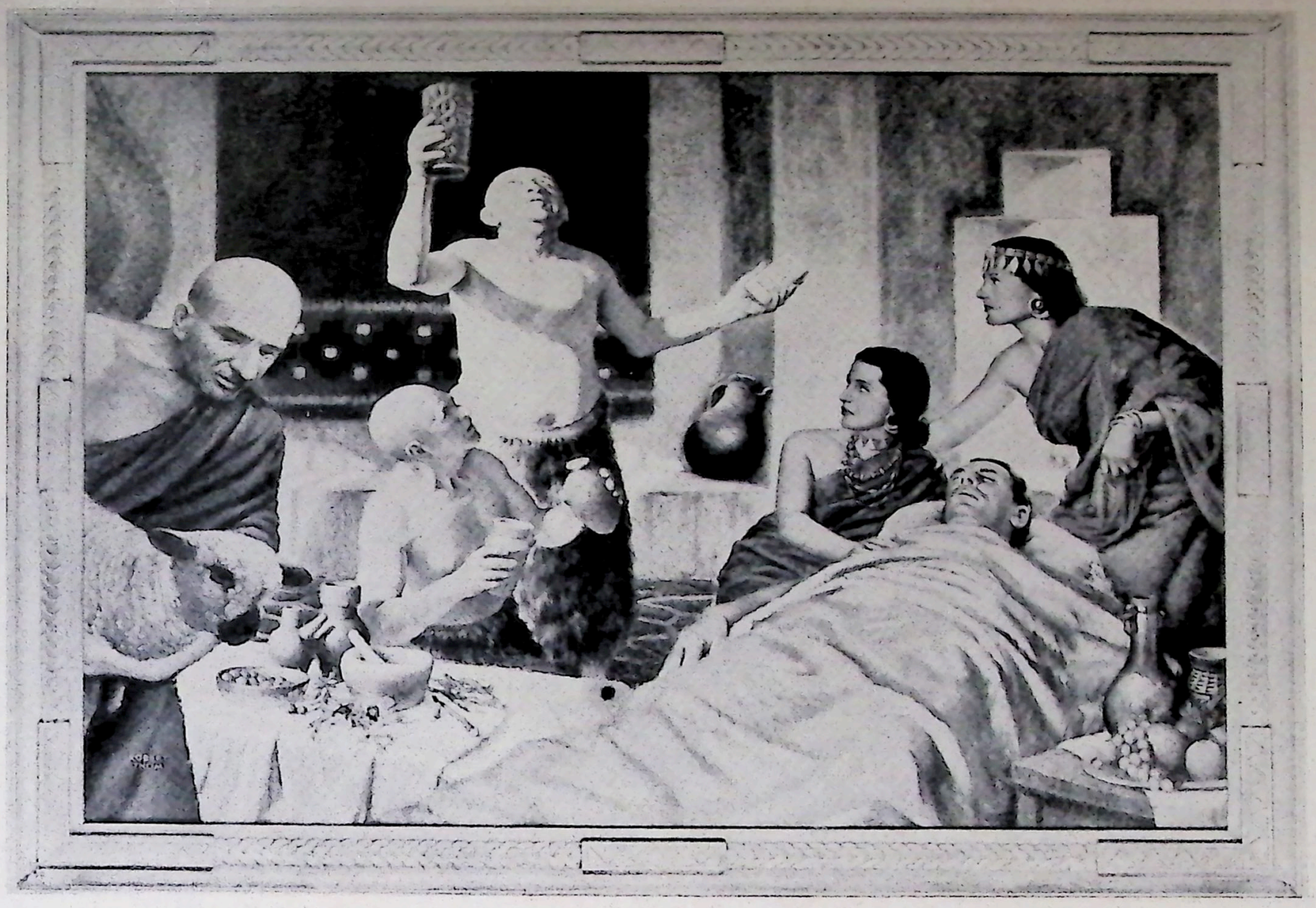
Selected Paintings

Talented young artist Robert A. Thom was commissioned by Parke, Davis & Co. to do "A History of Pharmacy in Pictures," depicting outstanding figures and significant milestones in the development of pharmacy. From this widely acclaimed series of 40 oil paintings, which took eight years of intensive research and 250,000 miles of travel, WISDOM *presents the following 24. Captions were derived from the original accompanying text by George A. Bender, Editor of "Modern Pharmacy," who conceived and directed the painstaking project.*



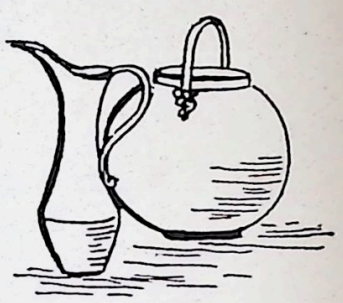
BEFORE THE DAWN OF HISTORY

Ancient man first learned to treat his wounds through instinct. Using materials at hand—cool water, a leaf or mud—he would place something over the wound to relieve the pain and to staunch the flow of blood. By trial and error he discovered which materials best served the purpose. This was the beginning of pharmacy, and many of today's medicines spring from sources as simple and elementary as those used by primitive cavemen many centuries ago.



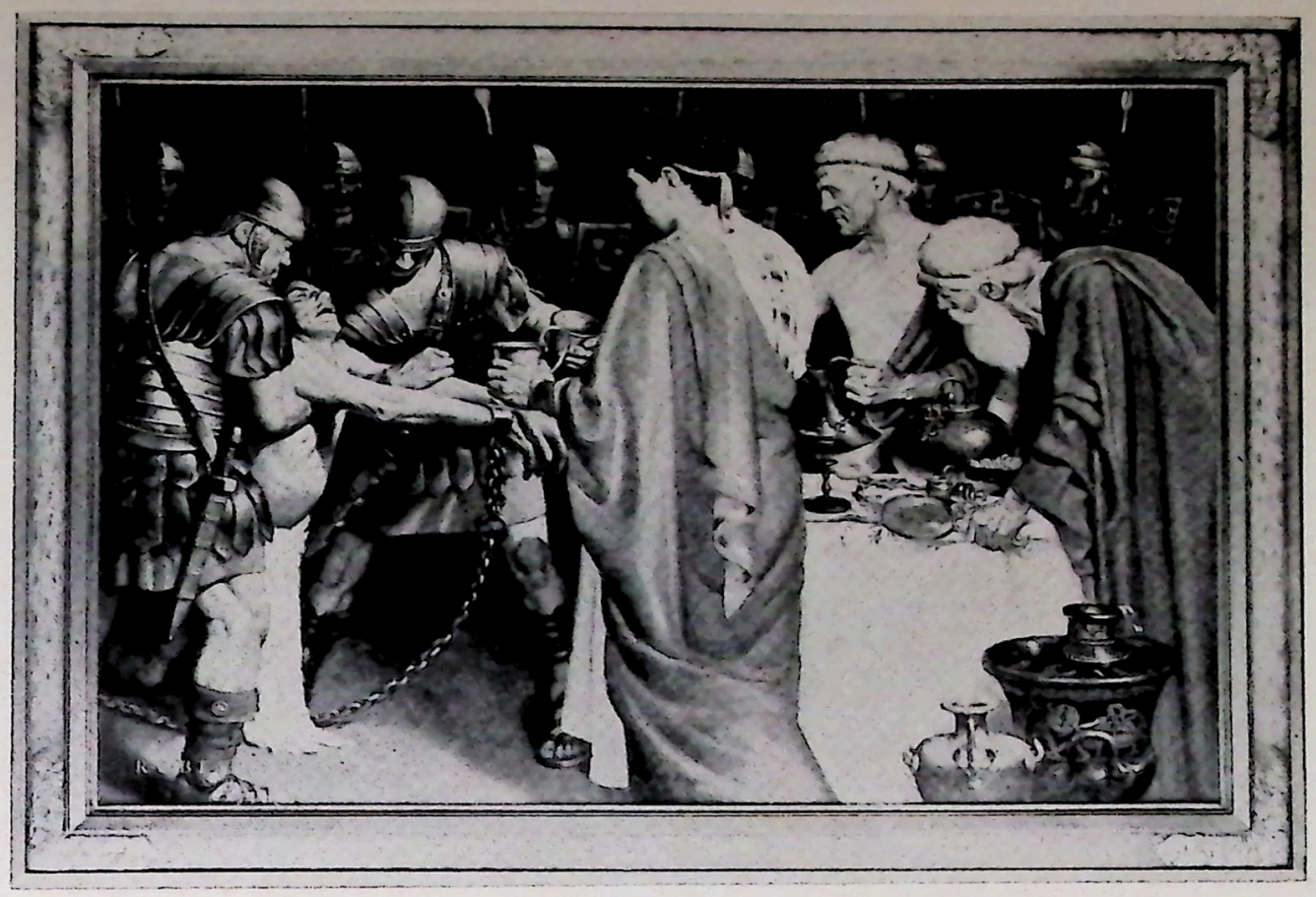
PHARMACY IN BABYLONIA (about 2600 B.C.)
Early man associated the action of drugs with supernatural forces—evil spirits had to be dispelled. Here a Babylonian priest-pharmacist-physician offers incantations in behalf of the ill patient, and instructions for compounding a remedy to his assistant, directions for both having been set forth upon the clay tablet he holds in his hand.

PHARMACY IN ANCIENT CHINA (about 2000 B.C.)
According to legend, Chinese pharmacy stems from Shen Nung, emperor who sought out and investigated the medicinal value of herbs, barks and roots. He is reputed to have written the first *Pen T'sao*, or native herbal, classifying 365 drugs. Among those that he is reputed to have discovered is Ephedra, which research revealed only 25 years ago to contain the important drug, ephedrine.

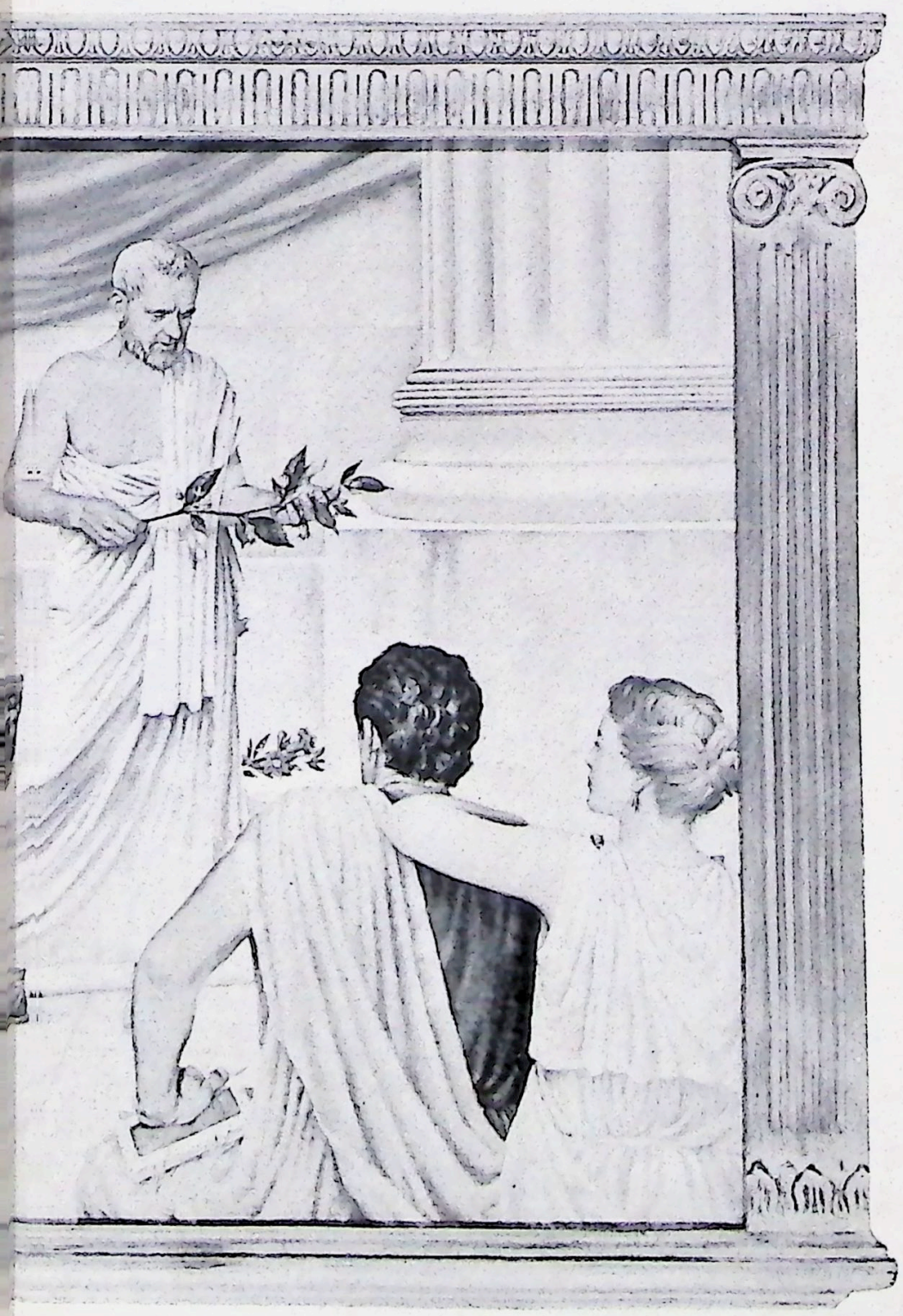


DAYS OF THE PAPYRUS EBERS (1500 B.C.)
Records indicate that Egyptian medicine started with Imhotep, physician to the court of King Zoser, about 2900 B.C. The best known, most important pharmaceutical record is the *Papyrus Ebers,* discovered by the German Egyptologist, George Ebers, in 1874. Egyptian pharmacists, like other professional men, were of the priesthood, but while incantation and ceremony played their part in treating the sick, there was a well-developed knowledge of drugs and their prescription.

FATHER OF PHARMACOGNOSY (about 300 B.C.)
Theophrastus, early Greek philosopher and natural scientist, is known as "the father of botany." He was a close associate of Aristotle and conscientiously fought the superstitious ideas and dogmas that prevailed in his time. In his ninth book, *History of Plants,* Theophrastus deals with the medical qualities of herbs. These studies form a basic structure for pharmacognosy. His pharmaceutical and pharmacological observations are unusually accurate, even in the light of present-day knowledge.



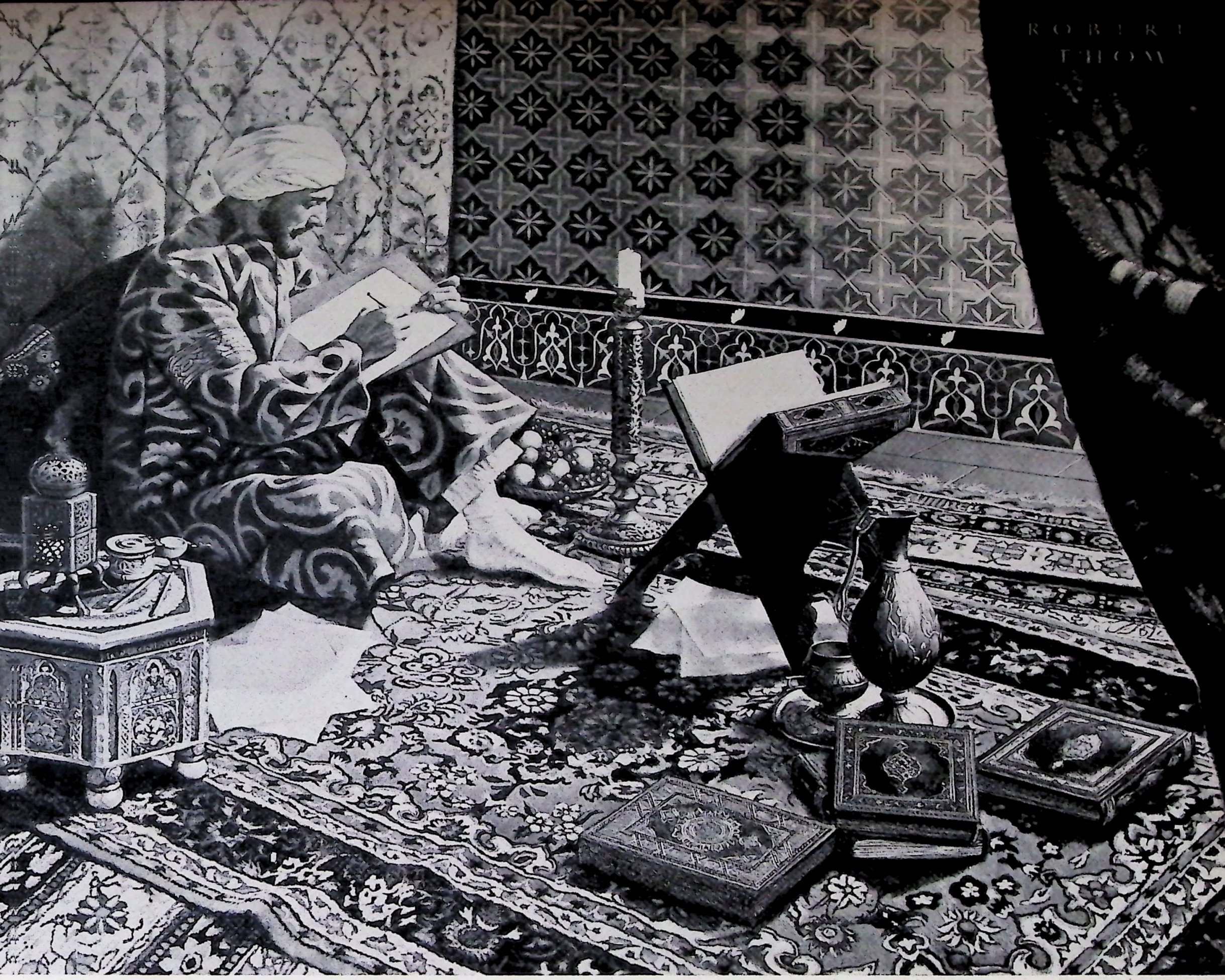
THE ROYAL TOXICOLOGIST (about 100 B.C.)
From men's fears and ambitions have come many scientific advances. In the days of Mithridates VI, King of Pontus, murder was accepted as a political device, with poisoning the current fashion. Mithridates developed to a fine art not only poisoning, but also the prevention and counteracting of poisoning. Here, at the king's command, a poison has been administered to a prisoner of war. Mithridates steps forward to test one of his many antidotes.



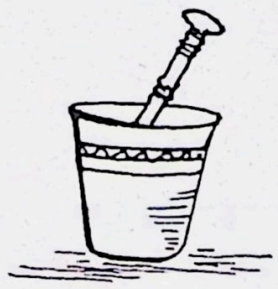
FIRST TRADE-MARKED DRUG
One of the first therapeutic agents to bear an identifying trade mark was *Terra Sigillata* (Sealed Earth), a clay tablet originating on the Mediterranean island of Lemnos before 500 B.C. The clay was washed, formed into pastilles and impressed while soft with a significant seal. This was usually done by priestesses in the presence of the local dignitaries. First seal is said to have been in the form of a goat.

GALEN—EXPERIMENTER IN COMPOUNDING (131-201 A.D.)
Of the men of ancient times whose names are revered in both pharmacy and medicine, Galen undoubtedly is foremost. Born in Pergamon in Asia Minor in 131 A.D., he practiced and taught both pharmacy and medicine in Rome, where he was physician first to gladiators and then to emperors. Galen's significance stems from his compounding and use of drugs. He was the originator of the formula for cold cream, essentially similar to that used today. He prepared all his medicaments himself, and his treatises are filled with formulas.

DAMIAN AND COSMAS (about 300 A.D.)
Twin brothers of Arabian descent, and devout Christians, Damian and Cosmas practiced the twin professions of pharmacy and medicine. They offered the solace of religion as well as their vast medical knowledge to the sick who pilgrimaged to their home in Egea (Cilicia) in Asia Minor. Persecuted and beheaded for their Christian faith, they became the professions' patron saints.

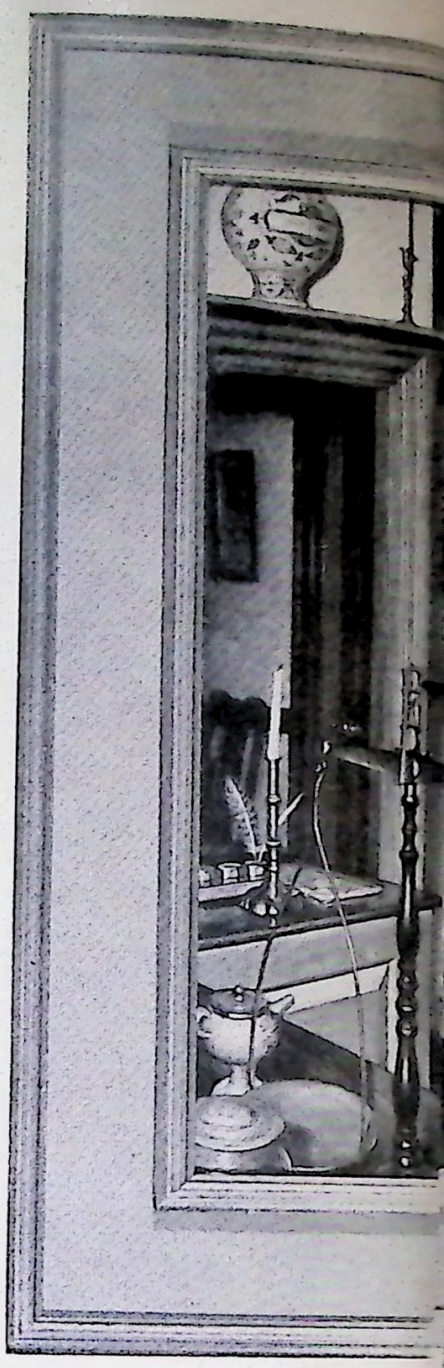


AVICENNA—"THE PERSIAN GALEN" (about 980-1037 A.D.)

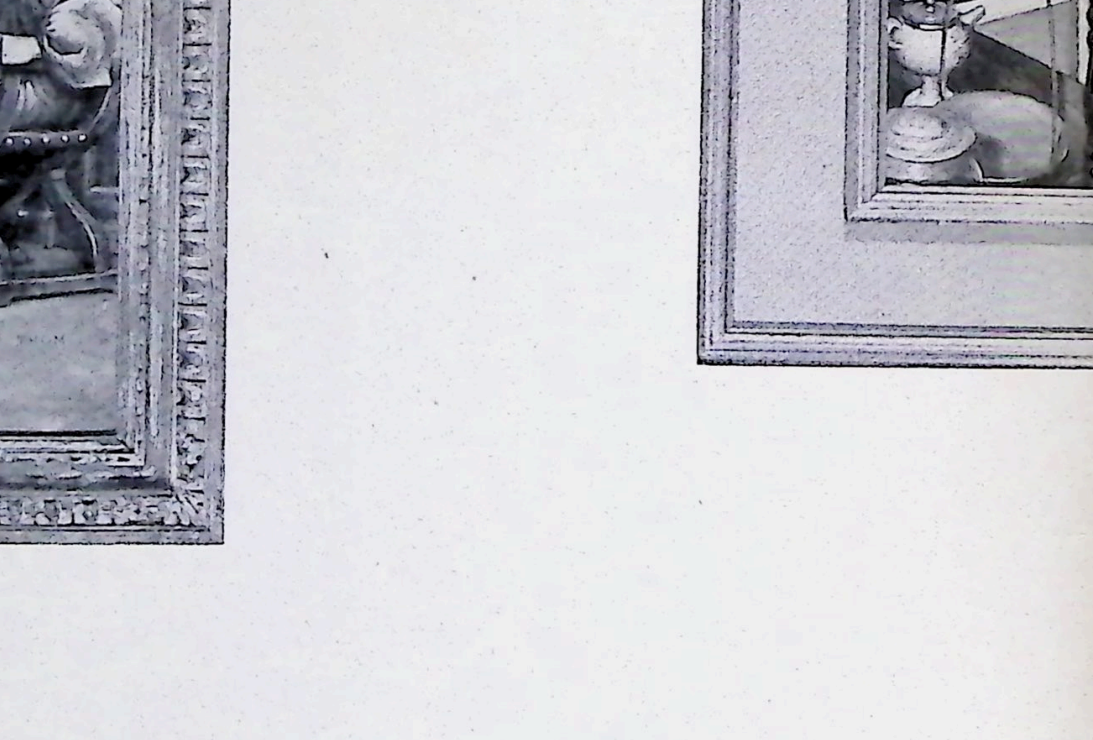


Perhaps the most brilliant contributor to pharmacy and medicine during the Arabian era was the Persian, Ibn Sena, called Avicenna by the Western world. Pharmacist, physician, poet, philosopher and diplomat, he wrote his books and treatises in Arabic, many of them while secluded in the home of an apothecary friend after escaping from political imprisonment. Avicenna's authoritative *Canon Medicinae* was studied and taught in the West until the 17th century. Arabian contributions to pharmacy—including separation of the apothecary's art from the physician's and introduction of the apothecary shop—advanced the development of medicine during the social and political upheavals of the Middle Ages when monks tried to preserve and utilize the remnants of antique pharmaceutical knowledge.

FIRST PHARMACOPOEIA (1498 A.D.)
The first official pharmacopoeia prescribing drug standards, *Nuovo Receptario,* was published in Florence, a collaboration of apothecaries and doctors aided by the Dominican political leader, Savonarola (seated, foreground). It was 50 years before similar pharmacopoeias appeared in other nations.



LOUIS HEBERT (first apothecary in Canada—1605)
Leaving his apothecary shop in Paris, Louis Hébert helped de Monts and Champlain build New France's first settlement, Habitation in Nova Scotia. As probably the first practicing pharmacist in North America, he looked after the health of the pioneers and cultivated native drug plants, samples of which were brought to him by friendly Indian neighbors.



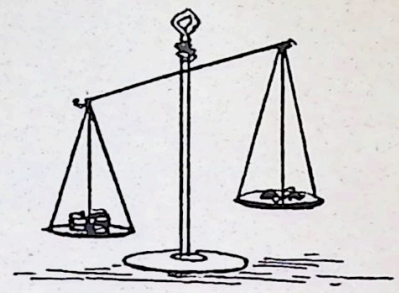
THE MARSHALL APOTHECARY (1729-1825)
An Irish immigrant, Christopher Marshall, established the first apothecary shop in Philadelphia in 1729. During the next 100 years this pioneer enterprise became a leading retail store, nucleus of large-scale chemical manufacturing; a "practical" training school for pharmacists; and finally it was managed by granddaughter Elizabeth, America's first woman pharmacist. Marshall's sons, Charles and Christopher, Jr. (shown as youths with their father about 1756) earned individual fame and carried on his fine traditions.

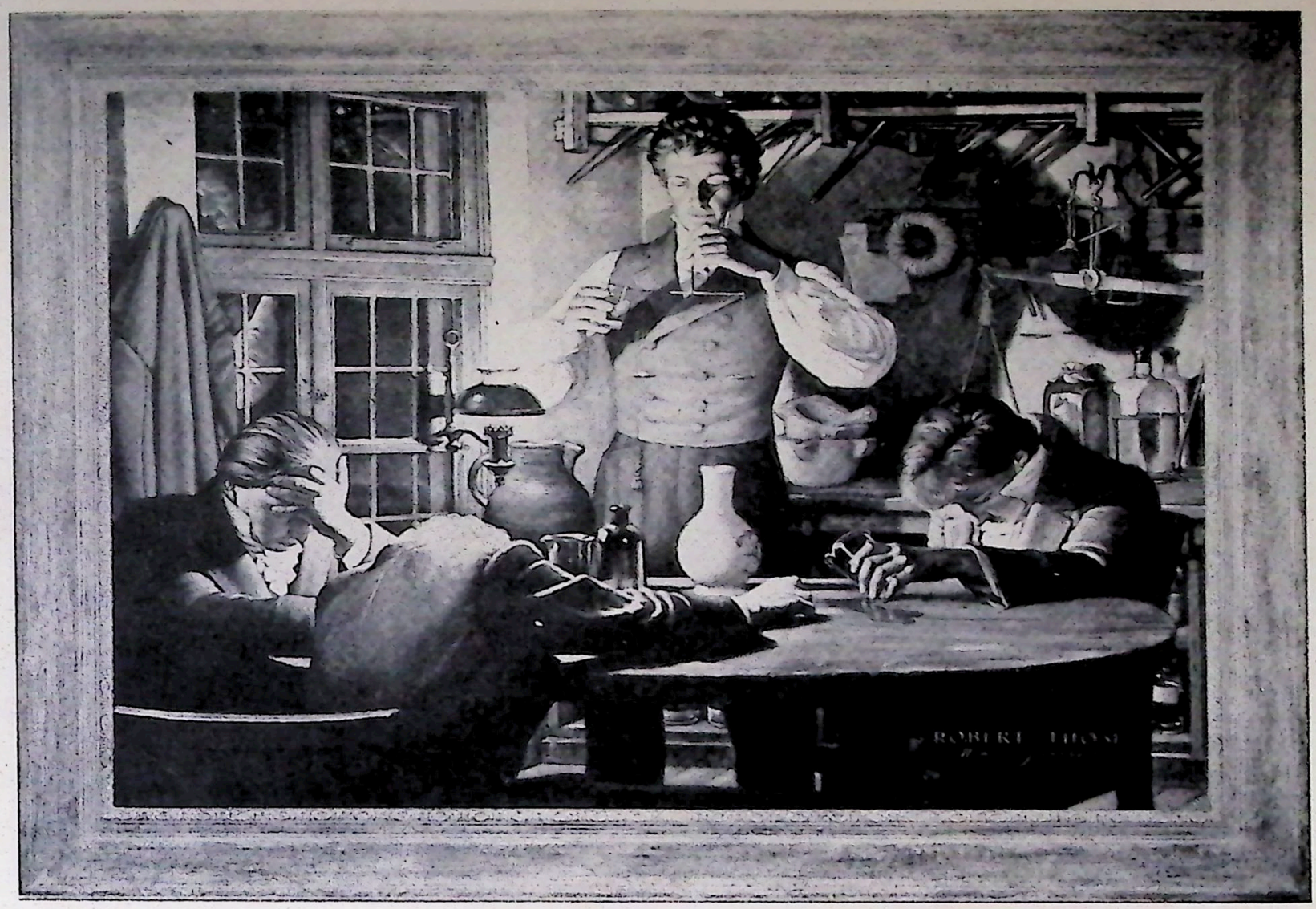
AMERICA'S FIRST HOSPITAL PHARMACY (1752)
One year after the Pennsylvania, America's first hospital, was started in Philadelphia (1751) with Ben Franklin's aid, the first hospital pharmacy was set up there. Second pharmacist John Morgan fostered many advances in American pharmacy.

CARL SCHEELE, PHARMACIST-CHEMIST (1742-1786)
Starting as an apothecary's apprentice in a corner of the stockroom, this Swedish genius reported one scientific discovery after another. First and foremost a pharmacist, his thousands of experiments gave the world oxygen, chlorine, tungsten, molybdenum, glycerin, and countless other organic compounds vital today.

FIRST APOTHECARY GENERAL (1777-1783)

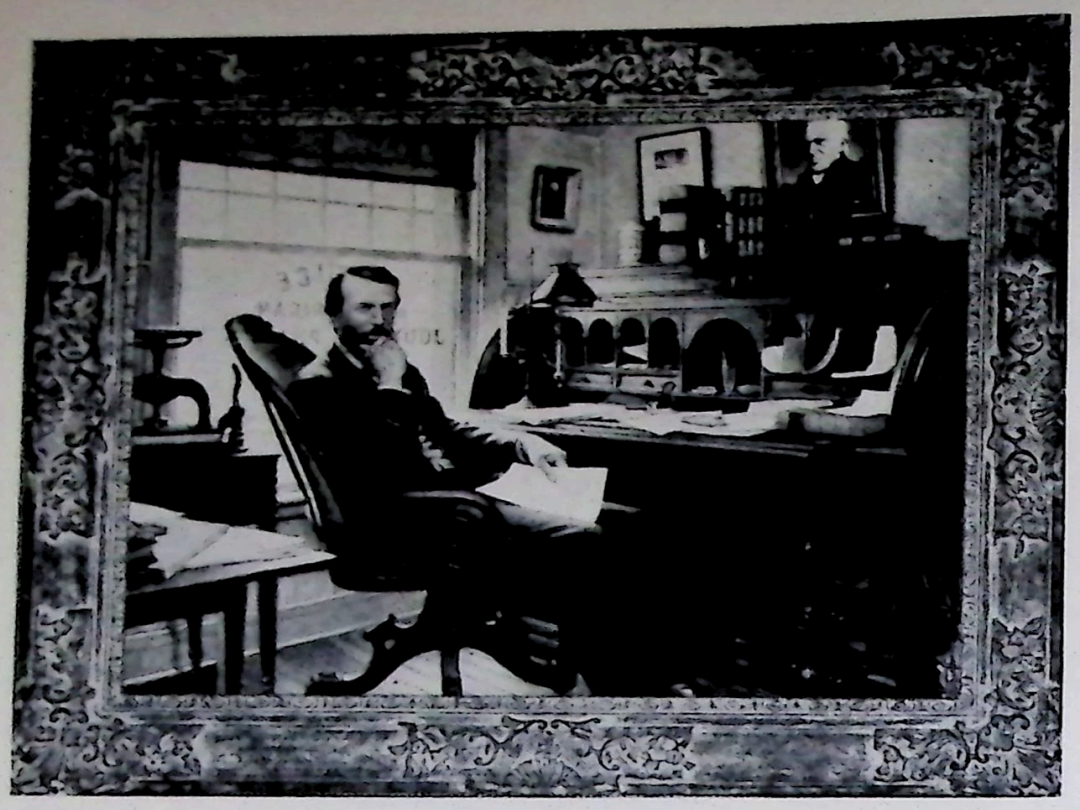
The role of pharmacists in the U.S. armed services dates back 180 years. First commissioned pharmaceutical officer in an American army was Andrew Craigie, Boston apothecary. As commissary of medical stores for the Massachusetts Committee of Safety, he was present at the Battle of Bunker Hill, and assisted in aiding the wounded at a makeshift medical station back of the lines. When Congress reorganized the Army Medical Department in 1777, Craigie became the first Apothecary General "to receive, prepare and deliver medicines... to the hospitals and army."





FIRST ALKALOID CHEMIST (about 1816)
The goal of isolating specific constituents from plant material was brought closer by Scheele, but the secret of opium's sleep-producing powers resisted discovery. It remained for a 23-year-old German apothecary, Friedrick Wilhelm Sertürner, to give the world opium's chief narcotic principle—morphine, and to initiate a new field of research: alkaloid chemistry. He proved morphine's effectiveness in dramatic tests on himself and three friends.

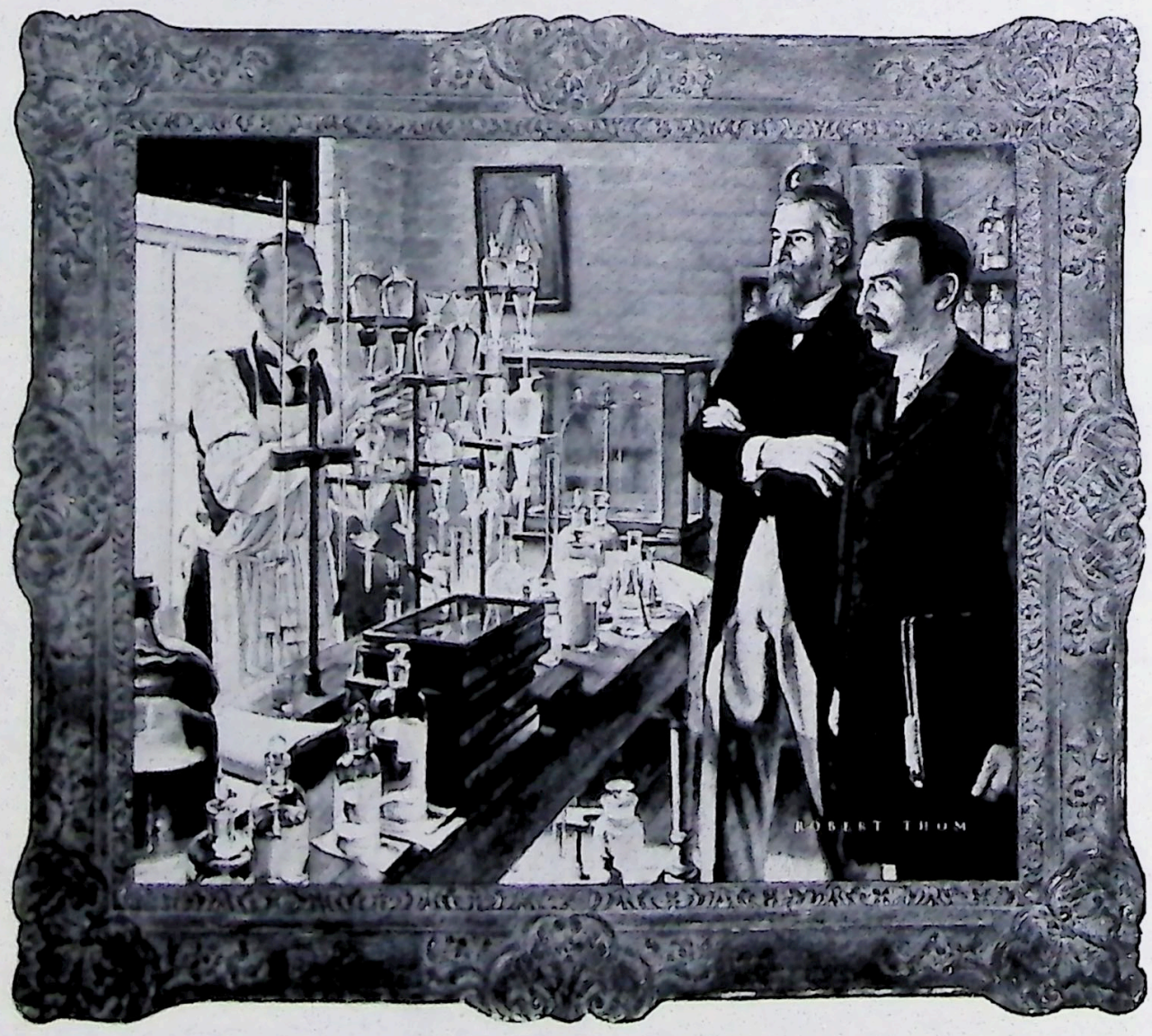
AMERICAN PHARMACEUTICAL ASSOCIATION (1852)
A need for better intercommunication among pharmacists; educational and apprenticeship standards; and quality control of imported drugs, led to the calling of a convention of representative pharmacists in the Hall of the Philadelphia College of Pharmacy, Oct. 6-8, 1852. The 20 delegates launched the American Pharmaceutical Association, mapped its objectives and opened its membership to "all pharmacists and druggists" of good character who would subscribe to its constitution and code of ethics.



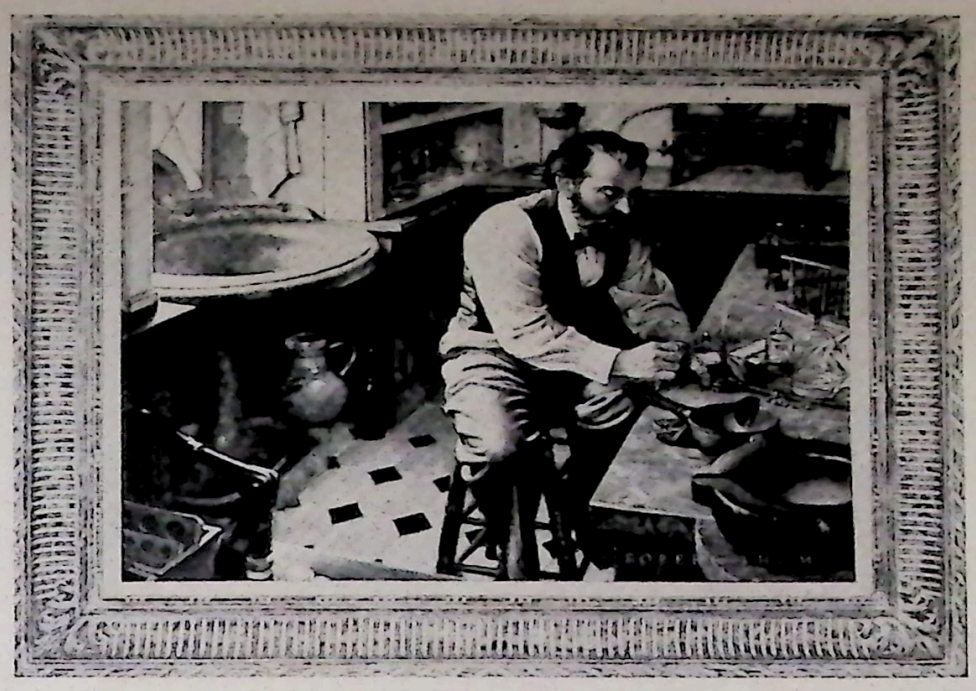
FATHER OF AMERICAN PHARMACY—William Procter, Jr. Procter (1817-1874) devoted almost his entire life to pharmacy. A graduate of the Philadelphia College of Pharmacy, he operated his own pharmacy; served the College as professor for 20 years; helped found the American Pharmaceutical Association, serving as its first secretary, later as president; and for 22 years was Editor of the *American Journal of Pharmacy*.

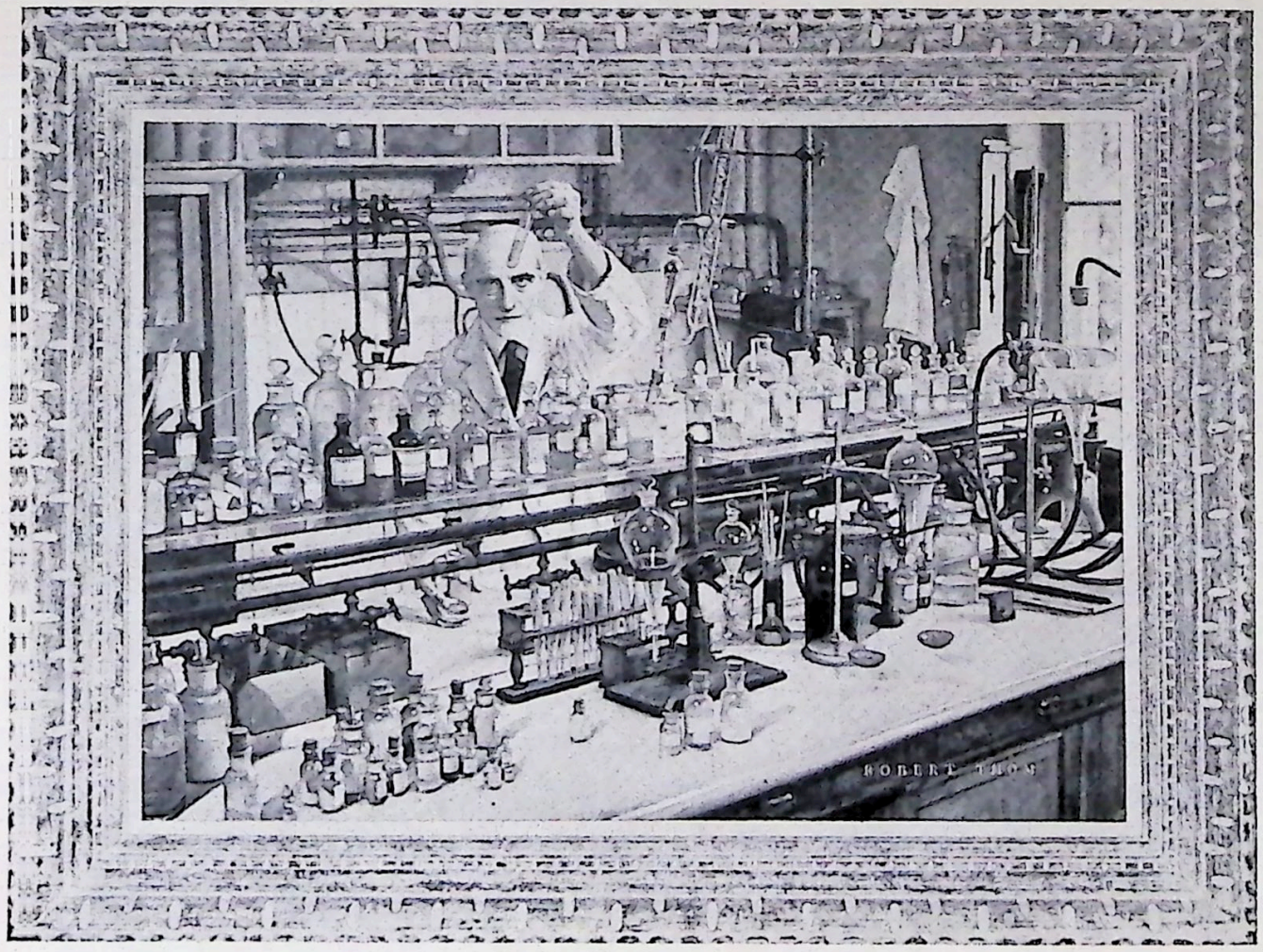
A REVOLUTION IN EDUCATION
Launching the pharmacy course at University of Michigan in 1868, Dr. Albert B. Prescott was criticized for not requiring pre-graduation apprenticeship. Among other radical changes he pioneered, later adopted by all schools, were laboratory work, basic science subjects, and a full-time-attention study program.

STANDARDIZATION OF DRUGS (1878-1883)
Despite the skill and integrity of 19th century pharmacists, seldom did two drug preparations have the same strength. It was the pharmaceutical manufacturing leaders who urged standardization and who sponsored revision of the United States Pharmacopoeia issued by the medical profession in 1820.



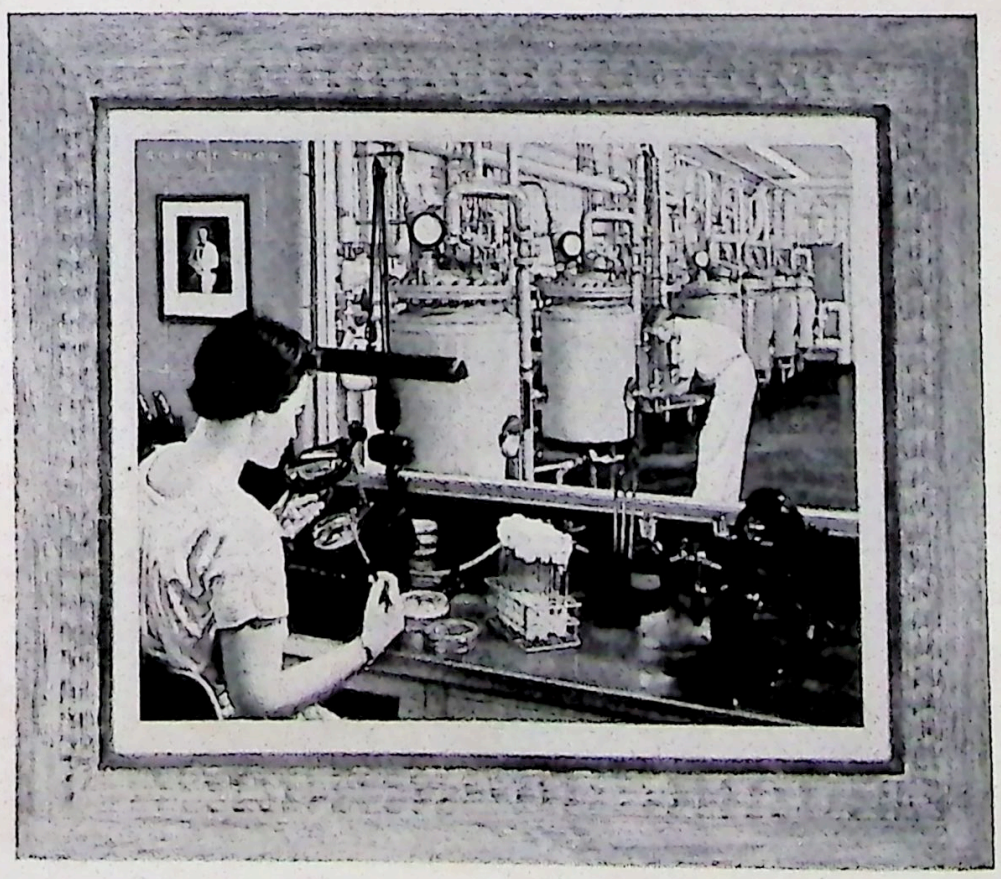
PHARMACAL INVENTOR (Stanislas Limousin)
Combining scientific knowledge with technical skill and inventive genius, the French retail pharmacist, Stanislas Limousin (1831-1887), introduced many new devices: the medical dropper; the system of coloring poisons; wafer cachets; apparatus for administration of oxygen; and sealing of sterilized glass ampoules.





DEVELOPMENT OF CHEMOTHERAPY
One of the most successful researchers in the fight against disease-causing organisms was French pharmacist Ernest F. A. Fourneau (1872-1953), who headed chemical laboratories at the Institut Pasteur, Paris. He advanced the treatment of syphilis and sleeping sickness, paved the way for the sulfonamide compounds, and produced the first chemicals to have recognized antihistaminic properties. His work led many other investigators to broad fields of chemotherapeutic research.

PHARMACY TODAY AND TOMORROW
Working together, modern pharmaceutical research and manufacturing methods have enabled all mankind to reap the benefits of pharmacy's 50 centuries of knowledge. With added impetus born of wars, American pharmacy has forged ahead to a position of world leadership. In the field of biologicals (from diptheria antitoxin in 1894 to polio vaccine) ... in the field of antibiotics (from penicillin in 1929 to tetracyn) ... in every phase of the never-ending battle against disease, pharmacy is always aware of its high traditions, ever-mindful of its great public trust.



Why They Became Doctors...

by Noah D. Fabricant, M.D.

It is a curious fact that doctors know very little about the reasons why they studied medicine. The question "Why did you study medicine?" has never attracted much attention in medical circles. As comprehensive a study as the Flexner Report on medical education, whose publication earlier in the century exerted a profound effect on the development of medicine in this country, fails to explore motivation as a factor in the selection of medical students. Oddly enough, this is also true of a recently published mid-century Survey of Medical Education of American medical schools. Like the Flexner Report, it fails to throw light on the motivating forces that lead young people to embark on a medical career.

To judge from the evidence provided by medical autobiographies, the decision to study medicine is greatly influenced by personal experiences, by an element of chance, and frequently by a process of elimination. J. Marion Sims, a young Southern doctor, hated to investigate the female pelvis – later on, he was to introduce novel techniques in gynecology surgery. But as a neophyte, Sims was cool to the selection of medicine as a lifework. His father wanted him to study law, his mother urged him to be a preacher, and he himself preferred business. A business career would have disgraced the family in the eyes of the community. There was nothing left for him to do but to select one of the professions. So Sims chose medicine.

Men and women have studied medicine for many reasons. Some of the reasons are colored by strong convictions that defy immediate analysis. Doctors dedicate their lives to the care of patients, occasionally for reasons other than a concern for their welfare. Moreover, doctors minister to the wants of their patients in some cases for ulterior, self-serving motives of which they may be partly or completely unaware. Most motivations surrounding medical people, however, appear logical, although what may seem rational in one instance does not necessarily make good sense in another.

The basis for the idealism that is tied up with the urge to serve one's fellow men is admirably reflected in the career of Elizabeth Blackwell, the first woman in the United States – the first modern woman anywhere – to receive the degree of Doctor of Medicine. The thought of studying medicine came to her during the illness of a friend. "The idea of winning a doctor's degree," she declared, "gradually assumed the aspect of a great moral struggle, and the moral fight possessed immense attraction for me." Actually, it was the intense desire to consecrate themselves to the service of

J. MARION SIMS *(1813-1883) was a Southerner who became a doctor although his father wished him to follow law as a profession. He achieved fame as a gynecologist of international reputation and founded the Woman's Hospital in New York City in 1885.*

HANS ZINSSER *(1878-1940) was the son of German political refugees. He graduated from Columbia University and attended the College of Physicians and Surgeons in 1899. After practicing for a short while he decided on a career in laboratory research. His reports on typhus and the bubonic plague were great contributions to the field of medicine. Zinsser published sonnets as well as his scientific findings. He died of leukemia while at work in his laboratory.*

WILLIAM CARLOS WILLIAMS *was born in 1883, and has been a practicing pediatrician for nearly 50 years. He became a doctor although he wanted to devote his life to writing. He has written many novels and stories based on his medical experiences, and in addition is considered one of the greatest American poets of this century.*

A. J. CRONIN *was born in Scotland in 1896. As a child he wanted to be a writer but knowing his parents disapproved, took up medicine instead. His experience in private practice provided him with much material for his many novels which have been read the world over. Dr. Cronin is presently living in New Caanan, Connecticut, and devotes all his time to writing.*

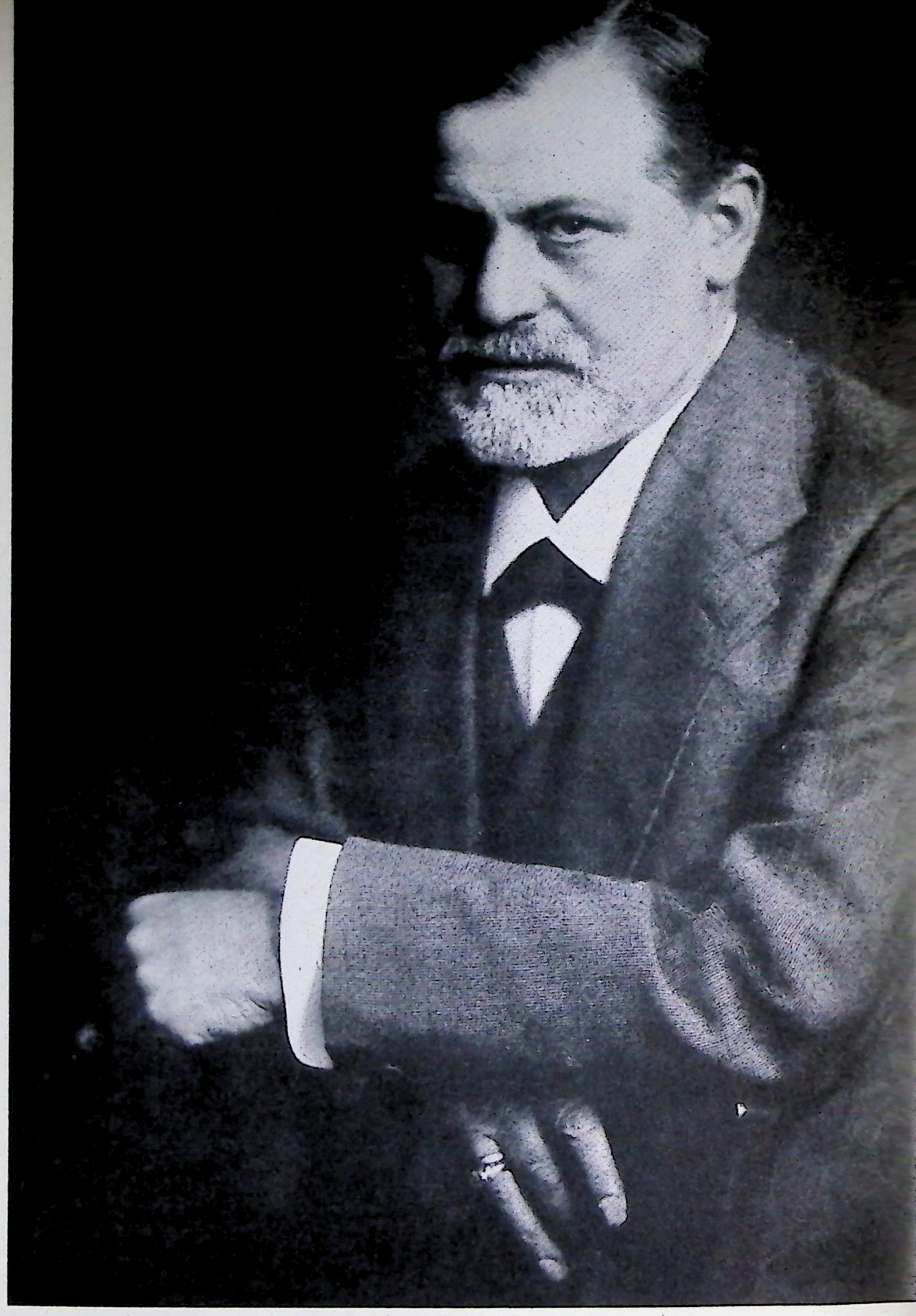
humanity that prompted Elizabeth Blackwell and other pioneer medical women in the United States to turn to medicine during the middle of the nineteenth century. This was by no means a simple matter, for in 1845 the public looked on "lady doctors" as freaks, and on the medical career as an unladylike vocation.

In contrast to the few who say they want to study medicine because of compassion for humanity, there are those who follow in the footsteps of medical parents. To Lenis Tryon the act came as naturally as eating candy. For even at the age of six he already felt destined for medicine as the sixth generation representative of the Doctor Tryon line.

Then there are those like Hans Zinsser who select medicine as a profession because they are fond of science itself. As a young man Zinsser questioned his talent for the life of a writer, turned to biology and then to medicine at the instigation of his teachers. Other novitiates find medicine attractive because as children they are impressed by the power and authority the family doctor seems to wield. A forthright reason advanced by Harry Carlos De Vighne typifies still another group – his real reason for deciding to study medicine, he declares, was due to an ardent wish "to be wanted" by people in distress.

Some youths are drawn to the study of medicine by prospects of an assured income or by a rosy picture of medical life. A few with a pronounced bent for literature pursue a medical career primarily for the purpose of being able to afford the luxury of writing. William Carlos Williams knew he would be unable to support himself by writing. And since a literary man had to be fed with reasonable regularity, he decided that the practice of medicine offered the best chances for survival. Similarly, A. J. Cronin, whose best-selling works of fiction often deal with the medical profession, turned to medicine because "it was safe and practical."

The medical profession did not at first interest W. Somerset Maugham, one of the great story tellers of modern times. But



SIGMUND FREUD *(1856-1939), known in every country in the world, is a giant in the field of medicine. He never felt any particular predilection for the career of physician; it was after hearing a reading of an essay by Goethe on nature that he decided to become a medical student. A graduate of the University of Vienna, he planned on laboratory research. It was while studying hypnosis that he became convinced his patients could consciously analyze their own unconscious minds, to "psychoanalyze" themselves. His theories, when first published, raised a storm of controversy but gave us the new fields of psychology and psychiatry.*

when, as an undergraduate medical student, he undertook a clerkship in outpatient departments and hospital wards, his interest in medicine sprouted. "I do not know a better training for a writer," he was to assert, "than to spend some years in the medical profession."

Many physicians say that they have been influenced by chance personal experiences that are either directly or distantly related to things medical. The father of Sigmund Freud, for example, insisted that the son follow his own inclinations in selecting a profession. Sigmund Freud displayed no special predilection for a medical career, and it was only after hearing Goethe's essay on Nature read aloud at a public lecture that the decision to study medicine took root.

Havelock Ellis, pioneer in the psychology of sex at a time when the word sex was taboo in polite society, also evinced little desire to study medicine. For a time Ellis thought of engaging in an ecclesiastical or a legal career. He arrived at the decision to become a doctor suddenly one night while reading a life of a famous English otologist.

Fortunately, prospective medical students the world over have always been imbued with a basic idealism to serve mankind. For many of them, the craving for a medical career is linked with the fervid wish to work with people in one way or another. In practice this differs from other types of interpersonal relationship.

At the age of 30, Albert Schweitzer, having attained stature as a theologian and fame as a musical exponent of Bach, determined to study medicine in order to become a medical missionary in French Equatorial Africa. A doctor, he had been told, was badly needed to combat sleeping sickness among the natives. Schweitzer sums up his motivations in these words: "The time must come when volunteer physicians, sent and supported by society, will go out into the world in large numbers and do good among the natives. Only then will we have begun to recognize and to carry out the responsibility which we as civilized men have . . ." ♦

Doctors, Diseases and Drugs

by T. Walter Wallbank and Alastair M. Taylor

As the Middle Ages drew to a close, public health, sanitation, and the general state of medicine were in a deplorable condition in practically all European localities. The few existing hospitals were terribly filthy. In one of the most important, for example, the Hotel Dieu in Paris, four or five patients were crowded into a single bed. Ailing infants, consumptives, typhus patients, and women in child labor were all intermingled. The hospital was filled with foul smells, since little attention was paid to sanitation, and the bodies of the dead were often allowed to remain for as long as a day beside those still living. Diet was also neglected. On some days there would be shortage of food; on others the patients would be allowed to gorge themselves, even get drunk.

In western Europe at this time there was no satisfactory anesthesia to deaden pain, the plague was a constant menace, the germ theory of disease was unknown, most patients preferred to die rather than undergo the torments of surgery and its uncertain results, and obstetrics was in the hands of ignorant midwives. The state of public health can be realized by the fact that the plague called the Black Death may have carried off fifty million people during the twelfth and thirteenth centuries.

Not until the thirteenth century did governments begin to concern themselves in the improvement of medicine. Surgery first became a real profession in France, and in 1515 this fact was recognized when the faculty of the University of Paris grudgingly admitted the surgeons as a department. From now on the professions of barber and surgeon were differentiated, barbers being allowed only to cut hair and pull teeth.

By the sixteenth century much of the medical power of the barbers had been removed so that medicine was in the hands of three corporations, or guilds: the apothecaries, the physicians, and the doctors.

In the sixteenth century many of the evils prevailing in medicine were swept away and it became a real science, mainly through the work of three outstanding men. Paracelsus inaugurated a new era in internal medicine; Vesalius created the modern science of anatomy; and Paré placed surgery on a rational foundation.

Paracelsus (1493-1541), christened Philippus Theophrastus Aureolus Bombastus von Hohenheim, was born in Switzerland. Even this long-winded appellation did not suffice, for later von Hohenheim added Paracelsus, with which he signed most of his medical works. At the age of sixteen he entered a university and soon was absorbed in the study of medicine. Seven years later, apparently annoyed with Scholasticism and the tyranny of tradition which dominated even the study of medicine, Paracelsus began traveling. On the eve of travels that took him to most of the countries of Europe, he sagely remarked, "If a man wishes to become acquainted with many diseases he must set forth on his travels. If he travels far, he will gather much experience, and will win much knowledge."

The life of Paracelsus was one long journey, for he was never permitted to stay long in one place. He was egotistical, and his writings seemed so opinionated that from his middle name, Bombastus, is derived the synonym for a high-sounding and inflated style of expression. For a time Paracelsus was a professor at the University of Basel, where he began by burning in public the works of Galen, Hippocrates, and Avicenna. He ridiculed the reliance of his contemporaries upon classical authorities and urged instead recourse to experimental science.

The gist of Paracelsus' teachings was that since the human body was basically chemical in its operations, only the prescription of the proper chemicals could cure disease. In short, chemistry must be utilized in the service of medicine. Paracelsus improved the preparation of many drugs and exposed the foolishness of time-honored remedies. He was the first to advocate the use of metals such as lead, antimony, and iron in prescriptions. The zinc oxide ointment commonly used today for treatment of skin diseases was introduced by Paracelsus. He also introduced opium in a new form, laudanum. The use of insulin, thyroxin, concentrated vitamins, sulphanilamide, and many other drugs and medicines are a logical unfolding of the methods advocated by Paracelsus.

If Paracelsus was the forerunner, the real founder of modern medicine was Vesalius (1514-1564), a native of Brussels. The Netherlander, while studying medicine at the university, became disgusted with the teaching, especially in anatomy. In this subject, his professors too often referred to pages in Galen instead of resorting to their scalpels. Dogs, not cadavers, had to serve the dissecting needs of the class. Vesalius complained that a medical student might just as well work in a butcher's shop to learn anatomy. In disgust, the young medical student left the university and launched upon a feverish hunt for cadavers.

Fear of persecution led Vesalius to Italy, where he became a professor of anatomy at the University of Padua. Under his inspiration the university became the foremost medical center in Europe. In 1543 he published a folio composed of seven books entitled *Fabric of the Human Body*. His work exposed numerous discrepancies in classical anatomy.

Vesalius showed the true structure of the body and exposed the errors in anatomy made by such men as Galen and Hippocrates; Ambroise Paré introduced a rational procedure for surgeons who wished to operate on the body. Paré was a Frenchman, born in Brittany in 1517. At an early age he was apprenticed to a Paris barber, and at nineteen he became an army surgeon. Attached to the French army, Paré saw many bloody battles and gained practical knowledge in how to extract bullets and amputate limbs.

Paré began to employ ligatures to arrest hemorrhage. It has been said that surgery presents three basic problems: how to ease pain, how to prevent infection, and how to stop bleeding. By employing the ligature, Paré solved the bleeding problem. Not until the nineteenth century were scientists able to introduce the other two solutions: asepsis and anesthesia. ♦

Ars Medica

A Collection of Medical Prints by Great Artists

FROM MEDICINE MAN TO DOCTOR OF MEDICINE

VISIT TO A PLAGUE PATIENT
by Gentile Bellini
Dramatizing the traditional obligation of the physician to minister to the sick at the risk of personal jeopardy, this woodcut appeared in 1491, when concepts of antiseptics were haphazard and varied medicaments were tried to combat infection.

PHYSICIAN AND PATIENT
by Erhard Reuwich
This woodcut is from one of the earliest handbooks of medical knowledge (1485). The artist, Erhard Reuwich, is celebrated as the first known book illustrator.

DR. EPHRAIM BONUS
by Rembrandt
Among the elements which differentiate the trained doctor from the witch doctor, are increasingly scientific methods of diagnosis and therapeutics, based on inherited knowledge and current research, and a code of ethics for service to mankind. Rembrandt's etching of his friend, Dr. Ephraim Bonus, is a masterpiece of characterization – at once noble, profound and humane.

ALLEGORY OF THE HEALING ART

ST. COSMAS AND ST. DAMIAN
by Johannes Wechtlin
St. Cosmas and St. Damian are traditionally acclaimed the patron saints of the physician and apothecary. The two brothers were Syrian Christians, and were reputed to have effected many miraculous cures before they suffered martyrdom in 303 A.D. They are represented here in a woodcut by the German artist Wechtlin, around the beginning of the 16th century.

THE BEGINNING AND END OF LIFE

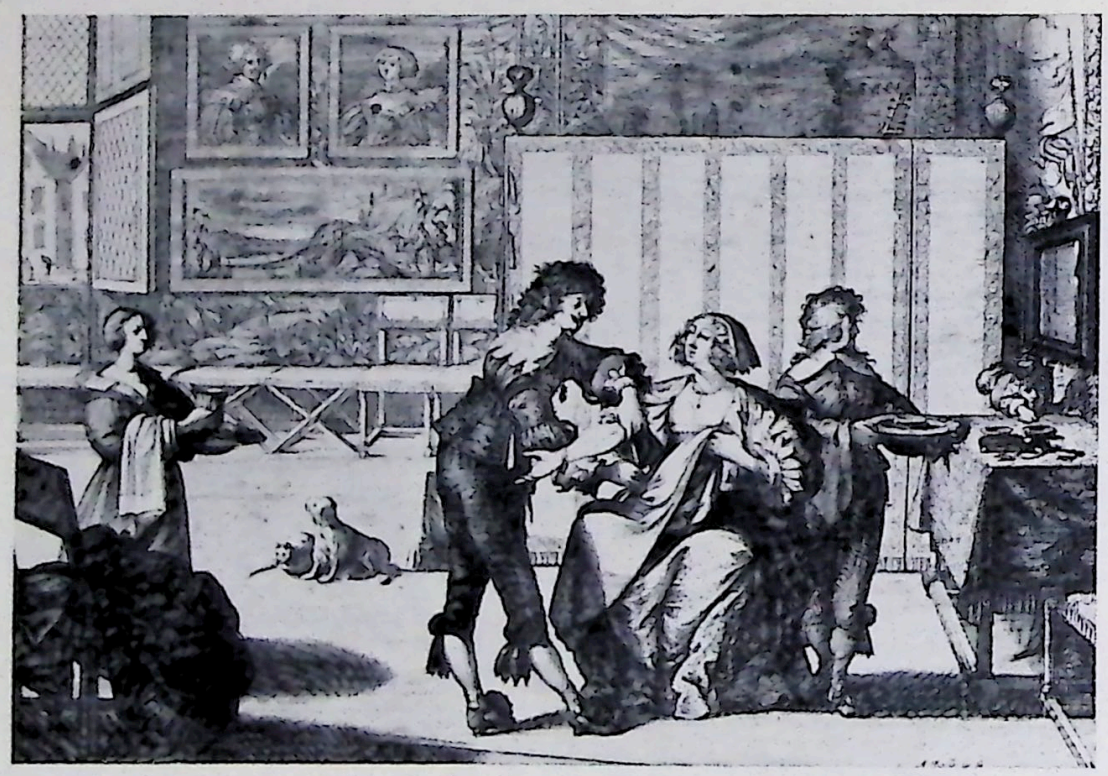
CHILDBIRTH
by Jost Amman
This woodcut by Amman (1539-1591) appeared in 1580 in Reuff's "De Generatione Hominis," a famous and widely used handbook for midwives. An astrologer is seen in the background, casting the child's horoscope.

THE DEATH SCENE
by William Hogarth
Originally engraved by Hogarth (English, 1697-1764), this scene is from his series "A Harlot's Progress," and shows her dying while two doctors argue about the respective merits of their remedies. It is said that Hogarth was satirizing two notorious quacks of the day.

DEATH AND THE PHYSICIAN
by Hans Holbein
In this woodcut the grim drama of mortality is focused upon the healing mediator himself, under the pertinent caption quoted from the Gospel of St. Luke: "Physician, heal thyself." The illustration was first printed in 1545 from the original wood blocks engraved by Hans Lutzelburger under Holbein's supervision.

THE PRACTICE OF MEDICINE

THE CONSULTATION
(Italian School, 16th Century)
This woodcut is taken from the title page of Panthaleo's "Pillularium," Pavia, 1516. The picture brings to life the Renaissance world in all its beauty and nobility.



PHLEBOTOMY
by Abraham Bosse
Abraham Bosse's etching of 1635 illustrates one of the commonest therapeutic measures in the repertory of the doctor of old: Phlebotomy. Bloodletting was also practiced by barbers and village surgeons; in fact the conventional red and white barber's pole refers to this aspect of their early profession.

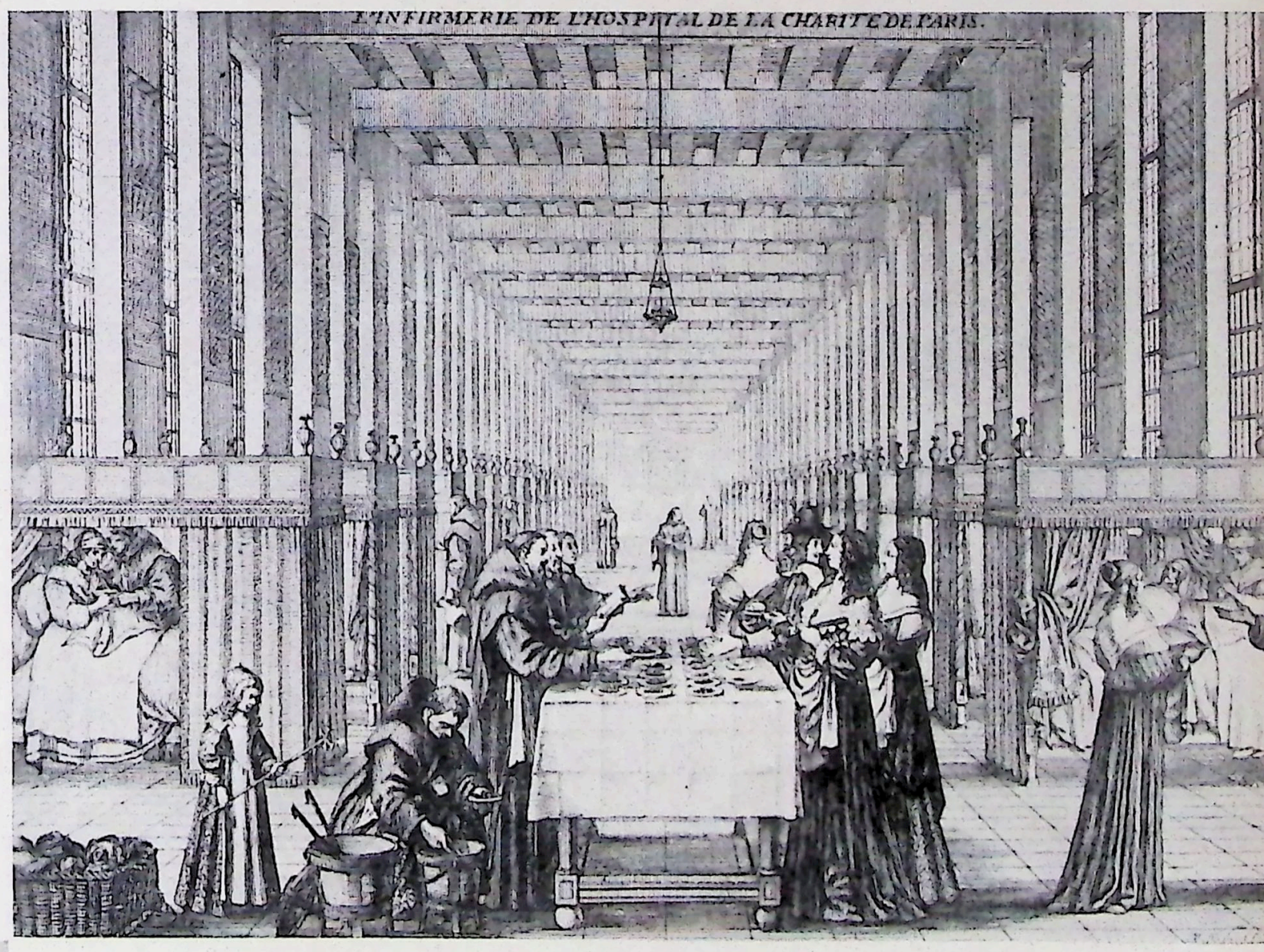
"OH DOCTOR, I'M SURE I'M CONSUMPTIVE"
by Honoré Daumier
A lithograph by Daumier in 1847, this picture contains a touch of satire, but of a humane and understanding kind.

SURGERY AND DENTISTRY

AMPUTATION
by Johannes Wechtlin
According to an analysis of the surgical practice in this picture (1540), the operator "Esmarched" the limb by means of a constricting band and, discarding cautery, checked hemorrhage by a self-styled styptic.

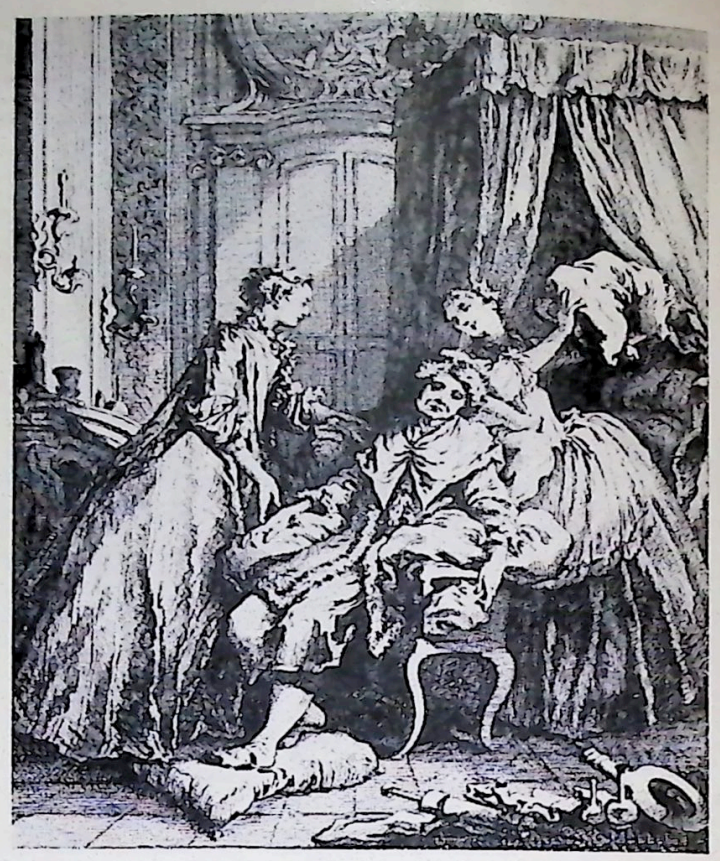
"LET'S SEE, OPEN YOUR MOUTH"
by Honoré Daumier
This lithograph by Daumier (1808-1879) is from the series, "The Difficult Moments of Life," Paris, 1864. The subject, timeless and universal, speaks for itself.

HOSPITALS IN PEACE AND WAR



INFIRMARY OF THE CHARITY HOSPITAL
by Abraham Bosse
This etching (ca. 1635) depicts an ecclesiastical foundation which still carries over some of the earlier meaning of the word "hospital." Originally it meant a place of rest and entertainment; later it covered institutions designed to care for the aged and the infirm.

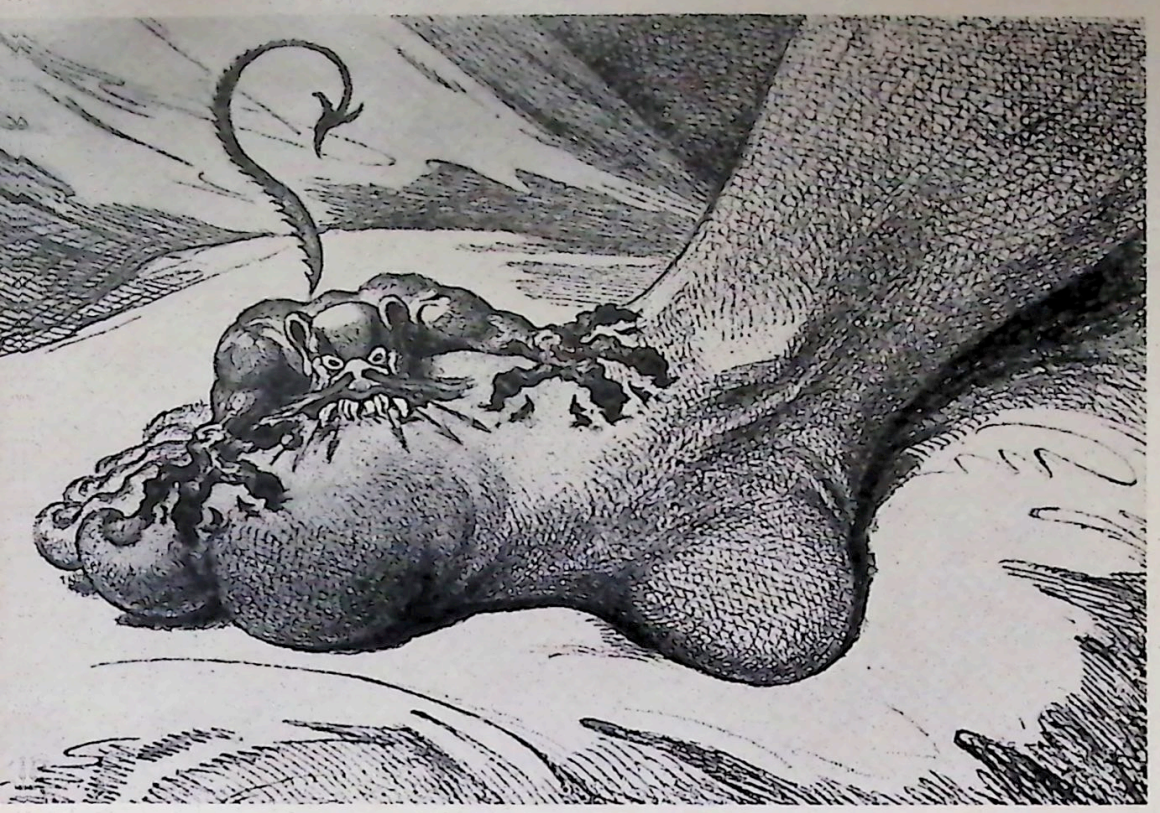
SURGEON AT WORK DURING AN ENGAGEMENT
by Winslow Homer
During the Civil War publication staff artists would send their drawings up north to be engraved on wood for printing. One of these artists was Homer, who later achieved fame as one of America's leading painters.



THE IMAGINARY INVALID
by Francois Boucher
The engraving "The Imaginary Invalid" is the frontispiece from the first edition of Moliére's "Le Malade Imaginaire" (1734). The engraving recalls Moliére's play which is, perhaps, the most caustic satire ever leveled against the medical profession.

OF WHAT ILLNESS WILL HE DIE?
by Francisco Goya
Among the many satires etched by Goya in his magnificent series of "Caprices," there are two referring to medicine. This one has been interpreted both as a caricature of Goya's own physician and as a veiled satire on Spain under premier Godoy.

A VISIT TO THE DOCTOR
by Thomas Rowlandson
English artist Rowlandson (1756-1827), a renowned caricaturist, etched this scene about 1810, reflecting the satirical attitude toward doctors of that period.



THE HEADACHE
by George Cruikshank
This early 19th century etching dramatizes the impact of a headache of such intensity that one might almost venture to diagnose it as migraine. Fifteen years later Daumier made a similar drawing. It is unknown whether he had ever seen Cruikshank's version.

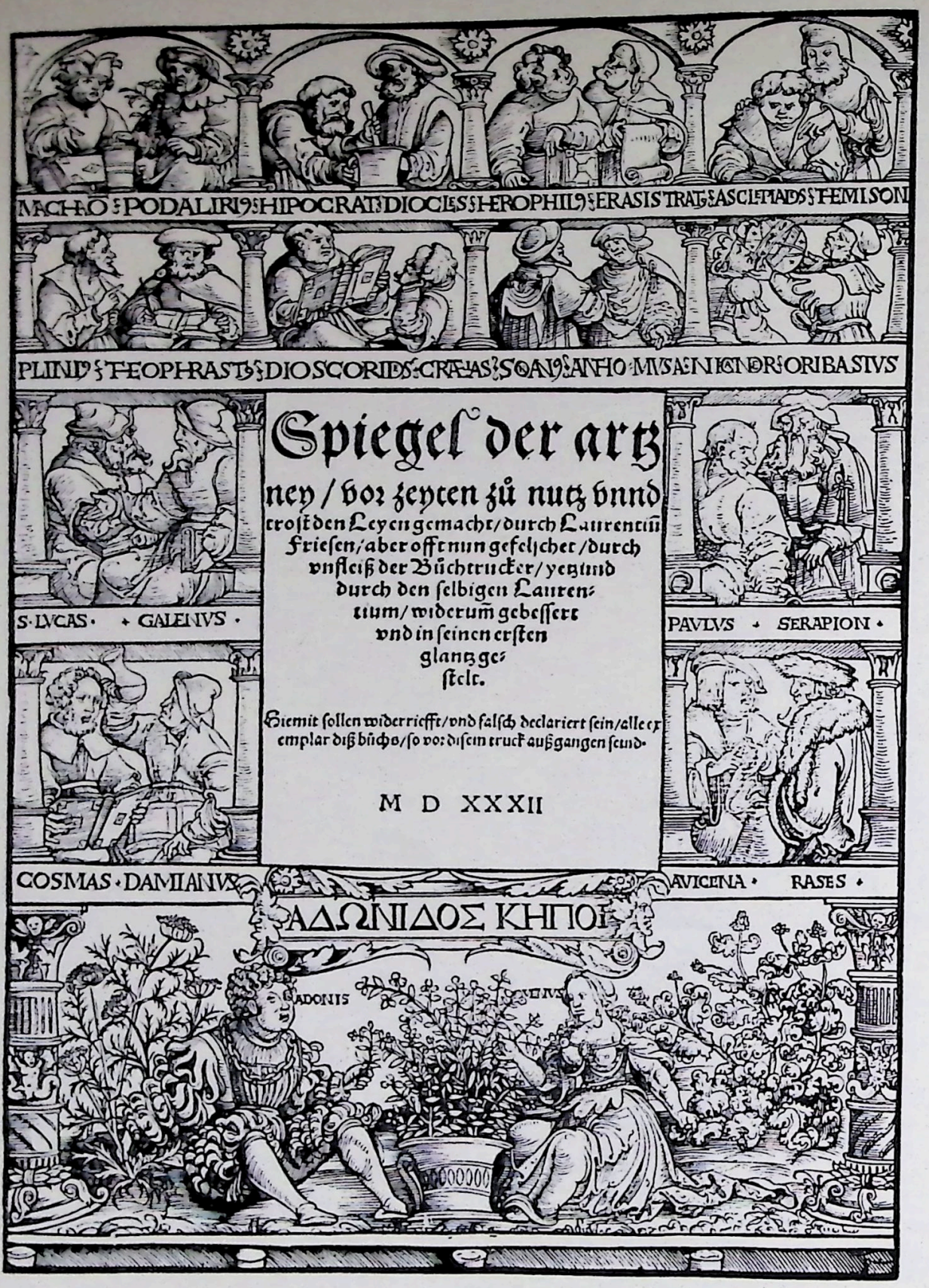
THE ARTIST LOOKS AT DISEASE

THE GOUT
by James Gillray
Perhaps the most famous imaginative portrayal of a disease is Gillray's interpretation of gout. It is believed that his vivid rendering of the pains of gout was based upon personal experience.

THE ARTIST OBSERVES THE SICK

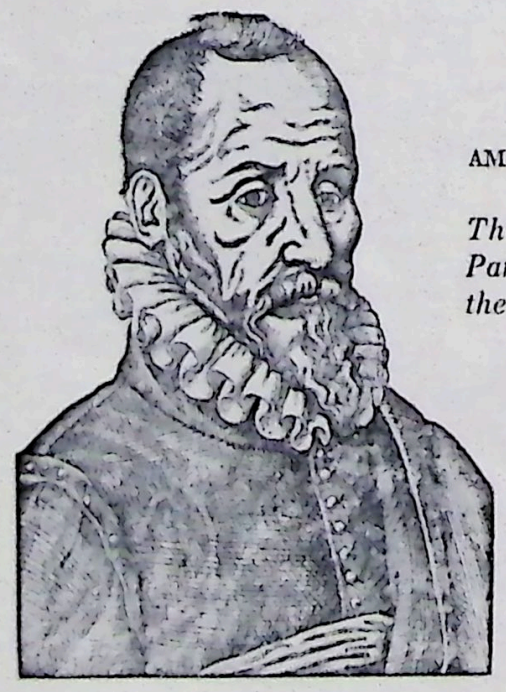
CARNOT ILL
by Henri de Toulouse-Lautrec
This 1893 lithograph illustrated a facetious monologue about French president Carnot.

THE SICK CHILD
by Edvard Munch
The theme of this moving 1894 drypoint – a young girl dying of tuberculosis – recalls Munch's tragic life: his mother and younger sister both died of the same disease.


MACHO · PODALIRIVS · HIPOCRAT · DIOCLES · HEROPHILVS · ERASISTRAT · ASCLEPIADES · THEMISON
PLINIVS · THEOPHRASTVS · DIOSCORIDES · CRATEAS · SORANVS · ANTHO · MVSA · NICANDER · ORIBASIVS
Spiegel der artzney / vor zeyten zů nutz vnnd trost den Leyen gemacht / durch Laurentium Friesen / aber offtmun gefelscher / durch vnfleiß der Büchtrucker / yetzund durch den selbigen Laurentium / widerumb gebessert vnd in seinen ersten glantz gestelt.
Hiemit sollen widerrieffe / vnd falsch declariert sein / alle exemplar diß büchs / so vor disem truck außgangen seind.
M D XXXII
S · LVCAS · GALENVS ·
PAVLVS · SERAPION ·
COSMAS · DAMIANVS
AVICENA · RASES ·
ΑΔΩΝΙΔΟΣ ΚΗΠΟΙ
ADONIS

ANCIENT AND MEDIEVAL PHYSICIANS
by Hans Weiditz
Weiditz drew these 24 portraits of ancient and medieval physicians on the title page of a medical handbook by Friesen (1532).

ANDREAS VESALIUS
by Jan Stephan von Calcar
This woodcut (1543) shows Vesalius when he was 28, while engaged in the research that made his name a medical byword.



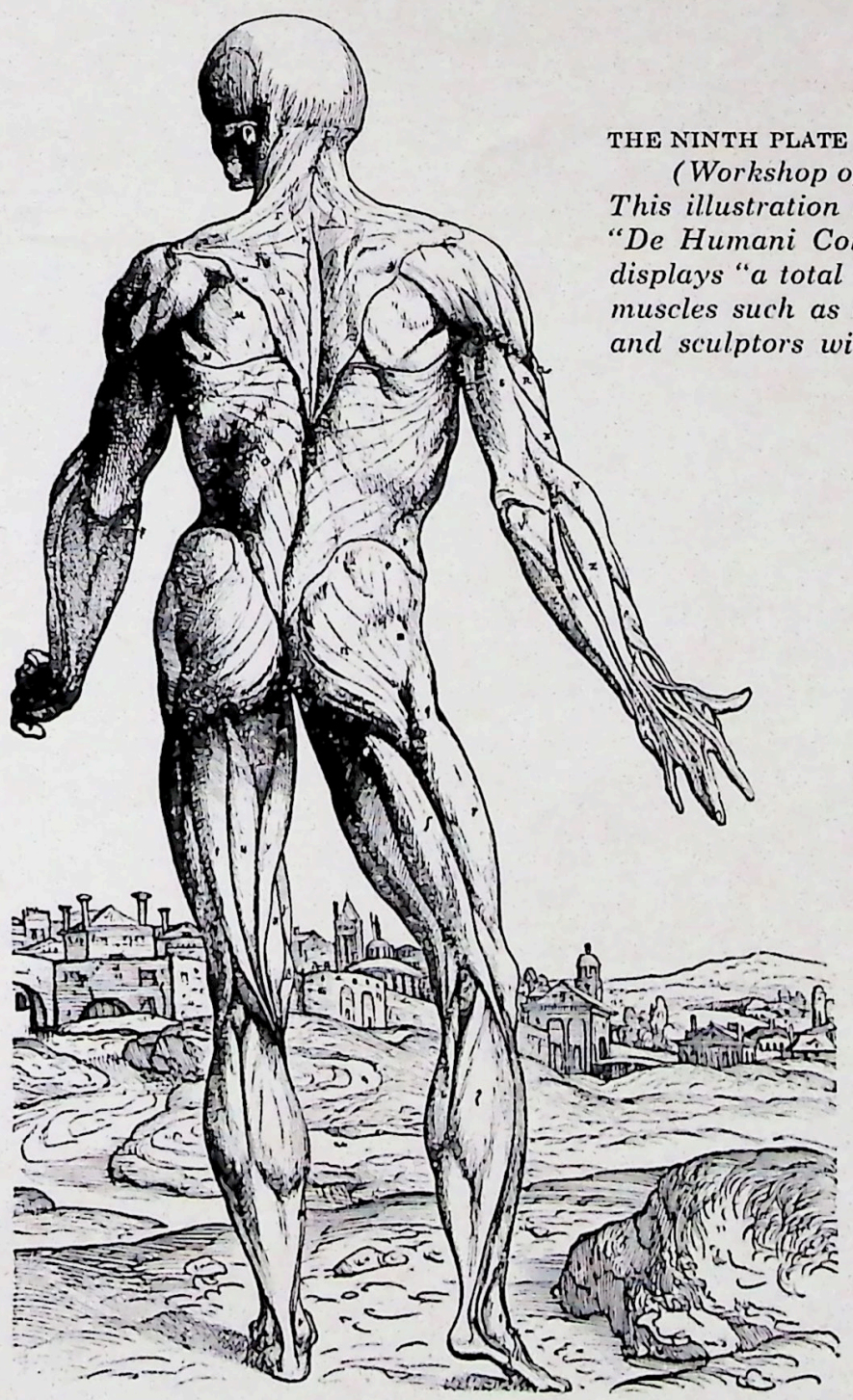
AMBROSE PARE
(German school, 16th Century)
This woodcut from the Latin edition of Paré's works, "Opera Chirurgica," shows the famous surgeon at the age of 68.

WILLIAM HARVEY
by Wenzel Hollar
This study (ca. 1640) by one of the foremost etchers of the century, is a sympathetic but searching portrait of William Harvey, discoverer of circulation of the blood.

SIGMUND FREUD
by Hermann Struck
In this sensitive etching from life we see the profile of Freud, founder of psychoanalysis. His discoveries in normal as well as abnormal psychology have modified basic concepts not only in medicine but also in education, sociology, literature, business and law.

ANATOMY DEMONSTRATIONS

VESALIUS TEACHING ANATOMY
by Jan Stephan von Calcar
The title page to the first edition of Vesalius' book "On the Mechanism of the Human Body" (1543) is one of the most famous medical prints in existence. While Vesalius did not operate out of doors amid such imposing classical architecture, this woodcut does portray the method in which he instructed his students.



THE NINTH PLATE OF MUSCLES
(Workshop of Titian)
This illustration in Vesalius' "De Humani Corporis Fabrica" displays "a total view of the muscles such as only painters and sculptors wish to consider."

The foregoing illustrations have been selected by WISDOM from "Ars Medica," a collection of 85 famous prints depicting the practice of medicine throughout the centuries. Carl Zigrosser, Curator of Prints at the Philadelphia Museum of Art, assembled the prints which are currently being displayed throughout the country under the auspices of Smith, Kline & French Laboratories.

The prints appearing here were chosen to represent certain phases in medical history as well as to depict the development and growth of the medical profession as recorded by famous artists.

FROM CAMPFIRES, CITIES...

John Charles Fremont — explorer, soldier and political leader — refused the post of professor of mathematics in the United States Navy and chose instead to serve as an assistant engineer in the U. S. Topographical Corps. In 1842 he headed an expedition to complete survey of the trail to the mouth of the Columbia.

by Allan Nevins

They were genuinely hungry when, January 10, 1844 they reached a large lake, 35 miles long, full of salmon trout on which they feasted. By this time they were in a region populous with Indians, and as they advanced saw signal smokes in every direction. Fremont named the water after an extraordinary rock rising from its midst, Pyramid Lake, and the fresh stream flowing into it, today known as the Truckee, the Salmon Trout River.

Still moving south, the expedition camped some 25 miles from the site of Reno, and on January 18 reached the Carson River. By this date the men were again tired and hungry, and the pack animals all footsore; moreover, the country ahead seemed to be barren, rocky and difficult.

Under these circumstances, Fremont felt justified in announcing to the men a determination which he was only too glad to reach — a resolution which had perhaps been half-formed when he left the Missouri and had then taken more definite shape with every mile. This was the crossing of the Sierras into California. It is barely possible that the expansionist senators, and Benton and Linn in particular, had reached an understanding with Fremont that he was to enter California and spy out the land. They knew that it was like a great ripe fruit, ready to fall into the first hand that touched it. They knew that some Britons were casting envious eyes upon it. They felt that if there was to be war with Mexico over Texas, the United States should possess authentic information upon the feasible mountain passes for an invasion of California, upon the resources of its fertile valleys, upon the strength and position of the Mexican forces under Governor Alvarado.

There was no necessity for entering California. He could have spent the remainder of the winter comfortably in the Truckee Valley. But to remain would have been a waste of good opportunities.

A Mexican decree had prohibited Americans from entering California anywhere, under any pretext, but that did not daunt Fremont any more than it did numerous American settlers.

As a physical venture, the attempt to cross the high Sierras in midwinter was appallingly foolhardy. This mighty range, in places 14,000 feet high, rises precipitously from the east, steep on steep, to a point where, in January, all is a silent, frozen waste of snow and rock, as bleak, empty and bitter as the Himalayas themselves with no life or movement save the terrific storms which sweep across the peaks and valleys.

If an unusual series of blizzards had overtaken Fremont's party, it could not have avoided the fate of the Donner emigrants,

overwhelmed and unable to move either forward or back. There are few passes in the high Sierras and in 1844 they were virtually unknown. No maps were available, no scientist had ever examined the range and no white man had ever crossed it in winter.

Yet Fremont embarked upon this perilous undertaking in a characteristically headlong way. Setting out January 19 on the second day he camped in the Pine Nut Mountains near the present site of Virginia City. He met an old Indian of the Washoe tribe, who volunteered to lead the expedition to a good pass, and not only accompanied them for two days but introduced some friendly tribesmen who sold them pine nuts.

The road grew constantly rougher as they approached the main chain of the Sierras, and on January 29 they were compelled to a step which Fremont deeply regretted, they abandoned their little howitzer which had been dragged so many miles and had never proved more than a useless encumbrance. A young Washoe was hired as guide and led them into the head of Antelope Valley but becoming cold and discouraged, shortly left.

Kit (Christopher) Carson was born in 1809 in Madison County, Kentucky. His parents died at an early age and he became a saddler's apprentice. He ran away and joined a caravan traveling to Santa Fe. Soon he had established a reputation as a professional trapper, hunter and guide. He became famous as a result of Fremont's reports of his skill and courage.

The Indians whom they met at this point all advised Fremont against continuing farther. They plainly thought the Sierras impassable. Already, in the foothills, the thermometer was below zero at night, and the snow three or four feet deep in places. Fremont, however, assured the savages that his horses were strong and would force a passage through the drifts.

On January 31, they perceived clearly what was before them. That afternoon, with the snow falling heavily and the weather so frigid that one man had a foot frozen, they descended a pass which gave them a long view westward. They saw embanked before them a great continuous range, its foot defined by the Carson River Valley, its lower parts steep and darkly clothed with pines, its magnificent crests hidden in gloomy snowclouds. This forbidding rampart was the central chain of the Sierras.

They started upward on the morning of February 2, a clear and frosty dawn, in a deeply serious mood. From this point, an old chief told them, it took six or seven days to cross the mountains in fair summer weather. Their Indian guide—for they had procured another—shook his head ominously as he pointed to the icy pinnacles of the Sierras thrusting high into the sky.

They now had 67 animals with them but their provisions were falling low. They possessed no tallow or grease, no salt, and had been so long without meat that one mess received permission to eat a fat dog which they had with them. The snow deepened immediately, and it was necessary to begin systematic path-breaking.

On February 3 they made less progress, only seven miles. On February 4 they were brought almost to a stop. In the afternoon they attempted to force a road toward a pass which the guide indicated ahead but their horses, after laboriously plunging two or three hundred yards, became exhausted and refused to make any further effort.

The party had no choice but to camp where they were, on the heavily wooded mountainside, without shelter, in a freezing wind. They built fires, covered the snow with large boughs, and soon had a degree of comfort. But many of the men were ready to give up. There ensued a striking scene, of which Fremont has left us a vivid picture:

"Two Indians joined our party here; and one of them, an old man, immediately began to harangue us, saying that ourselves and animals would perish in the snow, and that if we would go back he would show us another and better way to cross the mountain. He spoke in a very loud voice and there was a singular repetition of phrases and arrangements of words which rendered his speech striking and not unmusical.

"Our Chinook [guide] who comprehended even more readily than ourselves and believed our situation hopeless covered his head with his blanket and began to weep and lament. 'I wanted to see the whites,' he said; 'I came away from my own people to see the whites, and I wouldn't care to die among them out here'; . . . and he looked around into the cold night and gloomy forest and drawing his blanket over his head, began again to lament. Seated around the tree, the fire illuminating the rocks and the tall bolls of the pines round about, and the old Indian haranguing, we presented a group of very serious faces."

At dawn next morning their fainthearted Indian guide deserted. The lieutenant's mind had been busy overnight and he had resolved to set the majority of his party to making sledges and bringing up the scattered baggage while he and a few others undertook a reconnaissance on foot of the heights ahead.

This reconnaissance, in the face of terrifying obstacles, was effected on February 6. The snow lay in an average depth of five feet and not infrequently, as they judged by the tree tops emerging from it, was 20 feet deep. On steep slopes it was covered with a

icy crust of great slipperiness, down which the horses would sometimes slide helpless till some tree or rock arrested them.

After much effort, the party reached the crest of the range, slightly to the left of a pass which had been pointed out by their guide. A welcome sight met their eyes. The mountain slopes, in part densely wooded, descended steeply below them. Far in the distance at their base, lying half-defined in a warm haze, stretched a great smiling valley, its greens and browns untouched by any sign of snow. Straining their eyes, they could descry far to the west, not less than a hundred miles away, another smaller line of mountains — the low Coast Range.

Fremont gazed in delight while the men shouted for joy. It was the fertile Sacramento basin. "There," exclaimed Kit Carson, pointing toward the coast, "is the little mountain — it is 15 years ago since I saw it; but I am just as sure as if I had seen it yesterday." They could pick out spots of prairie in the valley and with the telescope could vaguely follow the dark line of the Sacramento. Then they turned hurriedly back toward camp for the sun was sinking.

The trail that had been beaten was filled with driving snow on February 9 and 10, when Fremont and a few others advanced only about five-and-a-half miles, leaving the animals at the base camp. For a time, it seemed almost impossible to get the horses and mules over the pass at all. Fitzpatrick, who had been left behind to make the attempt, reported that his efforts were futile. When he led them out on the half-hidden trail, the packed snow beneath would not support them, and they broke through. Some plunged about in the drifts and some lay buried in the white mass.

The poor beasts, which Carson tells us had been driven by hunger to eat one another's tails and the leather of the pack-saddles, possessed little strength. But Fremont refused to be defeated. He had the entire force turn to with mauls and shovels, set them to scooping and packing down a road and made them strengthen it with pine boughs. It was exhausting work, and the food on which they did it was none too substantial.

Final victory was won on February 20, 1844. On that day, the expedition camped with all its animals and equipment on the summit of the pass, 1000 miles by their tortuous road from the Dalles of the Columbia. (This pass, today called Carson Pass and marked for tourists by a granite boulder and inscription, lies west of the present-day town of Woodfords, California.)

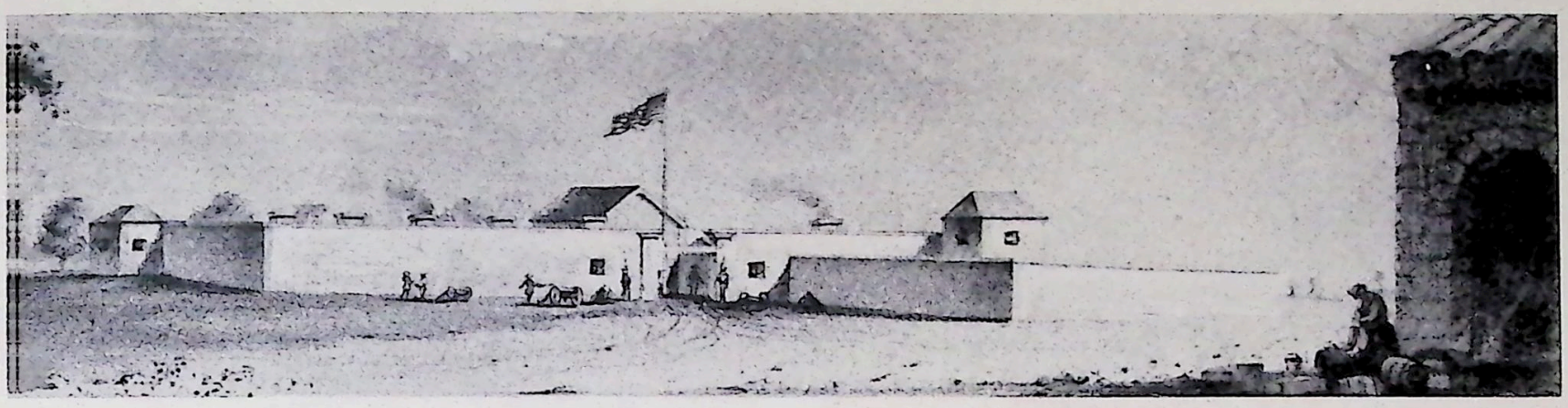
They had conquered the Sierras in midwinter. By boiling water on the pass, they computed its elevation at 9,338 feet. They watched the thunderstorm till sunset when the clearing skies revealed another magnificent scene: a long shining line of water which led westward toward another gleaming expanse, a broader and larger sheet. They knew that this could be nothing but the Sacramento River and San Francisco Bay. That night, as they made their campfires, they saw blazes lit in the valley below, as if in answer. They were actually the fires of Indians in the *tulares* of the bay, 80 miles distant.

On March 6, after many further trials, the ragged, hungry expedition, a woeful procession of weak and emaciated men each with a horse or mule as emaciated as himself, was approaching such civilization as that part of California afforded. They had found the Sacramento Valley, as they advanced, an enchantingly beautiful country, which seemed unequaled anywhere in the West for stock growing.

In mid-afternoon, cantering forward, Fremont and a little body of men in advance gave a sudden shout. They had come in sight of a little bluff, topped by a neatly built house with glass windows! It was occupied only by a few Indians but they rode forward more eagerly than ever.

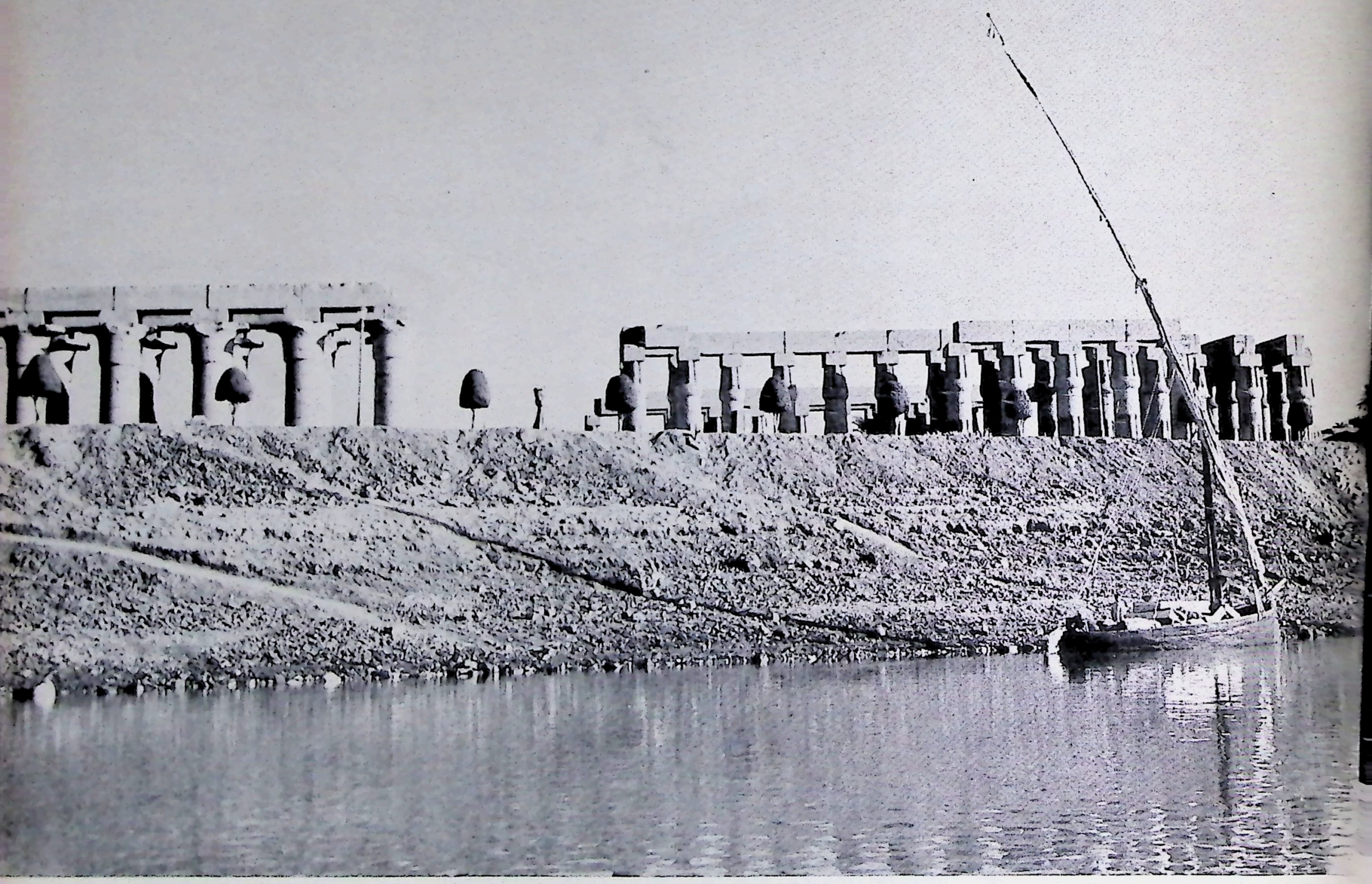
Carson questioned an Indian and joyously translated his replies to Fremont. The native told them that he was a vaquero, or cowboy and all the other Indians about were employees of the same ranch, belonging to Captain Sutter, upon whose riches and power he expatiated. The men had heard the name. In fact, it was known all the way from the Pacific to the Mississippi.

They rode forward, splashed through the river, and after a few miles came within sight of a large, low, powerful-looking structure of whitish adobe with several buildings rising over its enormously thick walls. This post, its chief angles bastioned by little blockhouses, was the fort built by Sutter as a defense against savages, marauding bands and the guerrilas whom the frequent outbreaks of civil war in California set loose upon the country. It was an edifice of manifest strength — the site of the future city of Sacramento. ◆



Sutter's Fort was originally built by John Augustus Sutter, a Swiss immigrant, for the governor of Mexico, but Sutter sided with the Americans in the Bear Flag revolt of 1846. The Fort became the site of Sacramento.

Sacramento City in 1849



Ruins of Luxor Temple on the Nile which has endured for 3,350 years

Papyrus stalk columns in hypostyle hall, Temple of Karnak

The power of the Nile

by Lisle March Phillipps

Along the banks of the Nile stand at intervals, like confessionals, the great temples in which Egypt has embodied its most secret thoughts and aspirations. The influence of the river pervades the building.

Throngs of ponderous columns bulge upward out of lotus calyxes to terminate in the heavy buds and blossoms of the sacred river flower. Again and again the same buds or open blossoms appear. They are held in the hands of sculptured figures and nod over the foreheads of gods and goddesses.

Friezes are formed of their stalks and heads, and bands of ornament composed of lotuses enrich the walls. But most of all it is the groves of huge shafts, distended, ill-proportioned, outraging every rational law of the evolution of structural form — most of all it is these imposing representations of the Nile's emblem which are responsible for the character of the whole interior.

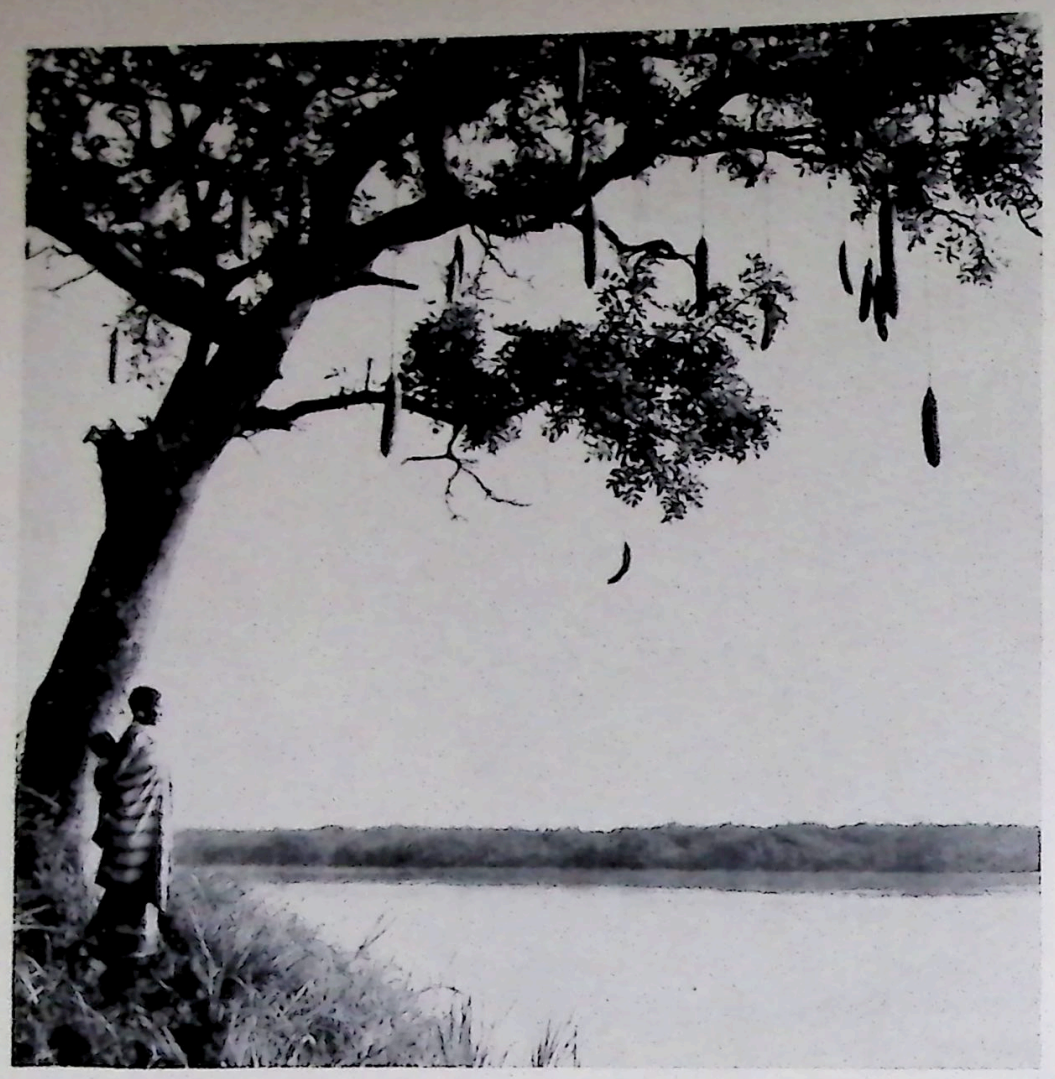
These huge obese features may be offensive to all our notions of structural propriety, but they were never invented to express a structural purpose. They were invented to express the ruling sentiment of Egypt — adoration of the Nile.

It is difficult to convey to one who has not felt their presence the influence of the river which exudes from these dense-growing groves of bulbs — for they are more bulbs than shafts.

All the feeling we associate with swamps and marshes, with sleepy, lapping water, with the succulent, rank growth of reeds and sedges, inhabits these dim interiors.

The influence which dominates Egypt is, in the Egyptian temple, focussed and concentrated. All other considerations, all the ideals pertaining to a structural art, are discarded that the presence and the power of the river may receive complete embodiment.

We may not approve the motive, but we cannot deny the force



The Nile is the longest river in Africa and the third largest in the world. The main course of the river begins in Khartum, where the Blue Nile meets the White Nile flowing from the lake region of Central Africa. It is the thread of life for millions of people living along its banks. They depend upon it for water, irrigation, food, transportation and sanitation. (Above) The river flows through the quiet, primitive regions of Northwest Uganda and on to the modern city of Cairo (right).

The life of the Nile dweller has changed little through the centuries. The river still provides him necessities of life. Here tribesmen fill their goatskin bags with drinking water.

of its effect. The Greeks, in their architecture, eliminated all local influences for the sake of purely artistic considerations. With equal disinterestedness the Egyptians eliminated all artistic considerations in order that a local influence might exercise over their art the dominion it already exercised over their lives.

What might be the limits of such an influence?

If we lived on the bounty of a river in a river-created country, knowing of no resources but what the river brought, our hopes and fears centered upon it, the habits of our daily life regulated by it, our traditions and literature and religion saturated by the slow infiltration of ages with the river's influence – should we have fared as the Egyptians fared?

Should we have accepted our river's beneficent tyranny, and would that tyranny have extended its sway from our outward lives to our inward habits of thought?

Would the power to express rational purposes in artistic forms have been denied us, and for 5000 years should we have been content to build our temple columns in the likeness of river bulbs?

To feel that it might have been so, and under what compulsion it would have become so, is to get in touch, perhaps, with the life of ancient Egypt.

So strong is the influence of Nile architecture that sometimes it has seemed as if, during hours spent in the dim colonnades of the old temples, he had unconsciously imbibed some of the nature and ideas of the ancient worshippers in these places.

It seemed that their life had become his life and their thoughts his thoughts; that the ebb and flow of the river rocked his existence as it had rocked theirs, and that the rows of white, dead hills bounded the universe for him as for them. Nothing, it seemed could ever intrude here to break the reigning routine or disturb the unvarying iteration of the months.

Hard by, the Nile itself rolls its majestic flood, surveying its crops and lands and people with a great landlord's benignant pride. "I made this Egypt," it seems to murmur to itself, "and I made the Egyptians. It was I also who built those temples, and by-and-by, I shall, perhaps, build others like them. What does it matter if there is a break in the series: after all, has not that often happened before?"

Heraldic columns in the Karnak Temple bear lotus stalk and lily designs.

The grandeur and majesty of ancient Egypt have intrigued the entire world. The solemn brooding Sphinx and the towering pyramids and temples amid restless, rolling seas of sand, are remnants of a lost civilization.

For many years the hieroglyphs on the tombs and temples were thought to be undecipherable. The discovery of the Rosetta Stone in 1799 by an officer in Napoleon's Army enabled Jean Champollion, in 1822, to decipher the forgotten writings.

The sacred carvings originated and developed within the limits of the Nile Valley. They tell of battles and the beliefs of the ancient polytheistic religions. The principal religious texts were designed to guide the dead kings into the life after death.

The Pyramid Texts are the oldest collections of literature in the world. It is believed that these were inscribed on the stone walls of five pyramids at Saqqareh during the later part of the Old Kingdom, 2400-2240 B.C.

The Egyptians, who have been called the greatest builders in history, were advanced engineers able to build in stone with a simplicity and beauty that has rarely been equalled. The preoccupation with life after death meant that the kings did not concentrate on the building of palaces entirely but also on great temples and tombs to preserve their bodies for all eternity. The temples glorified the kings in life and their tombs in death. The ancient Egyptians believed in an assortment of gods; perhaps the most venerated was Osiris, god of the underworld and judge of the dead.

The Egyptian temple was shut off from the street by lofty walls adorned with religious scenes. It was entered by a small gateway between two pylons which led into a forecourt open to the sky. Then came the hypostyle hall with pylons which was used for processions.

The Temple of Karnak (at left) contains a huge colonnaded, or hypostyle hall, the largest ever built. Its size is so great that the central ceremonial hall alone could encompass the Notre Dame Cathedral. The roof of the temple is supported by rows of columns, some so large that a hundred men could stand on the top of one of them. Egyptian architects were the first to utilize the column on a large scale to support the roof. ◆

THE CHINESE MIND

Lion, T'ang Dynasty (8th century)

With the recent social and political upheaval that has taken place in China, the continuity of this land's age-old culture is threatened. What long-range effects this upheaval will have upon the Chinese mind is, at best, speculative. However, the inertia of traditional and deeply ingrained mores will, undoubtedly, play a vital role in the shaping of China's future.

by John A. Pope

The underlying ideas which guide the Chinese in the course of his life today are the products of 3000 years of continuous development of popular beliefs and superstitions, many and varying schools of philosophy, and the adoption and adaptation of foreign religious systems. This is, of course, also true of an American or a European; but the differences between them and the Chinese should be noted.

The intellectual heritage of the Occidental is largely European with a certain amount of Near Eastern thought included, while, aside from a few similarities based on contact with the Near East, the ingredients of the Chinese mind are characteristically Asiatic. Furthermore, whereas the European preoccupation with industry and science has in recent times served to divert attention from the past to the present and future so that much of the traditional background is forgotten, the lack of any such movement in China, or, at least, the very slight extent to which it has affected the Chinese as a whole, has permitted a vastly greater proportion of the ideas of antiquity to remain in the minds of the people. This fact, more than any other, accounts for the essential continuity of Chinese culture during its 3000 years of history, and for the ability of China to carry on and survive.

The study of this subject is the study of Chinese philosophy and religion; and without going into detail on the beliefs of individual schools and sects, a brief enumeration of some of the major elements that make up this body of thought may give a general picture of the whole.

The earliest records indicate that the people of Shang (14th-12th century B.C.) had no supreme god, that they worshiped their ancestors and consulted them by means of divination, and that they accepted and followed the advice thus received from their honored dead. When the western people of Chou overcame the Shangs they brought new beliefs with them, principally belief in an all-powerful, all-seeing god who protected the just and punished the evil. This new idea combined with the old, provided a set of beliefs which included devotion to a supreme god and to lesser gods of nature – Sun, Moon, Mountains, Rivers, etc. – as well as to deified ancestors who were the culture heroes of the race, the founders of agriculture, spinning, weaving, pottery making, irrigation and flood control.

Divination played an increasingly important part. In the writin of the questions and interpretation of the answers lay the begin nings of literary activity; the diviners had to keep written record of their work, and the accurate recording of this material calle for chronological precision. Their works were, in effect, the earlies historical writings, and the fact that they were primarily concerne with the advice of deceased ancestors required a close study o genealogy. Thus the priests who conducted these activities wer at the same time historians, genealogists, keepers of the calendar and astrologers, while in the latter capacity, as interpreters o supernatural sources of information, they were advisers to th government whose influence must have been decisive. This whol body of thought – belief in a supreme god, in lesser gods, i deified ancestors, and in the importance of divination – may b considered the basis of the native Chinese religion, a religio which Dr. Hu Shih has aptly called Siniticism.

With the gradual collapse of the centralized authority unde the Chou house (after 771 B.C.) social values broke down an the progressive thinkers of the age devoted their efforts to attack ing the old superstitions and the reliance of government on opinion that manifestly had no greater authority than the not altogethe unselfish views of a small group of court astrologers.

From the sixth to the third centuries B.C. was the period o the philosophers, those wandering teachers who moved betwee the feudal courts advising local rulers on matters of state an human relations, and whose gradually collected writings are th Chinese Classics. On these works are based two great schools o thought which have, in spite of constant modification and reinte pretation, played dominant parts in the subsequent developme of Chinese thought.

Confucius, Mo-Tzu, Mencius, Hsün-tzu, and Han Fei-tzu ar the leading names of the Confucian school. Though their view were often diametrically opposed, all were concerned with puttin the conduct of the state on a human basis; that is, they believe that sound government depended upon the proper adjustment relations between men (it was in the method of this adjustme that they differed sharply) rather that upon superstitious beli

The other school, which came to be known as Taoism, originat

in the rather simple back-to-nature movement of a man known as Lao-tzu (the Old Master) who taught that man should follow the dictates of nature, at the same time avoiding all conflict. His follower Chuang-tzu interpreted him in highly mystical terms; and, before long, the practice of Taoism included everything from extreme asceticism to ecstatic orgies, magic, witchcraft, alchemy, and the search for an elixir of immortality.

In each new dynasty the rulers brought with them certain new gods and religious beliefs current in those parts of China from which they came, and these were added to the old Sinitic religion. Thus, while Confucianism was pronounced the orthodox state cult under the Han, Taoism and Siniticism thrived by its side, with members of each group acknowledging interest and belief in some of the phases of the others. Sometimes one would hold the ascendancy, sometimes another; but at all times the three together probably exerted equal influence in the formation of Chinese thought.

Added to this threefold native Chinese religion was Buddhism, which was imported from its native India about the time of Christ and in the next three centuries spread rapidly on Chinese soil. In many ways the doctrine of Buddhism was fundamentally opposed to Chinese ways of thought. It taught celibacy, which conflicted with Confucian insistence on the sanctity of the family and the importance of abundant posterity. Its asceticism was carried to the extent of mutilation of the body and even complete self-destruction, in contrast with the Confucian view that the body is a sacred inheritance from the parents, to be cherished and preserved at all cost. It advocated begging for its monks.

These are but a few of the discrepancies between the two; and yet Buddhism flourished. It was the most elaborate and splendid religious system the Chinese had ever seen. It provided punishments for evil and rewards for goodness in the shape of fearsome hells and magnificent paradises that gave the Chinese hitherto unimagined glimpses of a life after death.

These gods were represented in anthropomorphic form, and the carving, casting, and painting of images were tangible activities in which anyone could take part, and in return for which definite religious merit was acquired. The translation and interpretation of the sacred texts from India offered similar rewards to the literate class; and the ceremonies of devotion, in which Buddha images were bathed, clothed, and offered food, and where music, dancing, and pageantry were parts of the service, offered dramatic and emotional experiences resulting in spiritual rewards.

Another feature of Buddhism unfamiliar to the Chinese was the interest in abstract metaphysical speculation stressed by certain sects. Straight-forward, factual thinking had been a Chinese characteristic, and the long-winded, hair-splitting arguments on the nature of life, existence, consciousness, death, and a thousand other questions, fruitless as they may have been, were strange and attractive intellectual exercises to many of the converts.

Buddhism had many more sects than had the old philosophies of China, some more and some less popular. After the first few centuries of fanatical reception to everything that was offered, however, many of the beliefs were cast aside, and those that were retained underwent such thorough modification that they became almost purely Chinese. The Ch'an (Zen) sect, for instance, rejected all recourse to images and texts, and emphasized introspective meditation as the key to all knowledge. The combination of centuries of imaginative speculation and more centuries of strictly disciplined self-examination came, in the long run, to have a profound effect on native Chinese thought.

As in the past, the various schools of thought and religious systems were never mutually exclusive, and Confucian scholars, who reviewed the ancient classics with the broadened viewpoint

The heritage of the past permeates the thoughts and actions of all levels of Chinese society—the city-dwelling intellectual . . .

. . . modern youth

. . . the peasant farmer

"Sakyamuni as an Ascetic" is a lacquered wood sculpture of the Yuan Dynasty (1279-1368 A.D.). Although Buddha bore the name Guatama, he was often referred to as Sakyamuni. This piece reflects the other worldly concentration of man dedicated to the ideal of virtue and spiritual perfection.

and increased mental flexibility gradually acquired from their contact with the intellectual gymnastics of Buddhism, found that they suggested much more than had previously been imagined. The interpretation of Confucian thought on the basis of Buddhist ways of thinking gave rise to the rational philosophy of Neo-Confucianism.

Also included in the background of this new school of thought, which became fully developed about the 11th and 12th centuries A.D. and flourished until China began to show an active interest in western ideas in the 19th century, were elements of religious Taoism. This school, to be distinguished from the simpler philosophical Taoism, had borrowed freely from Buddhism through the centuries and had become a complex and elaborate religion with deities, canonical texts, and all the trimmings.

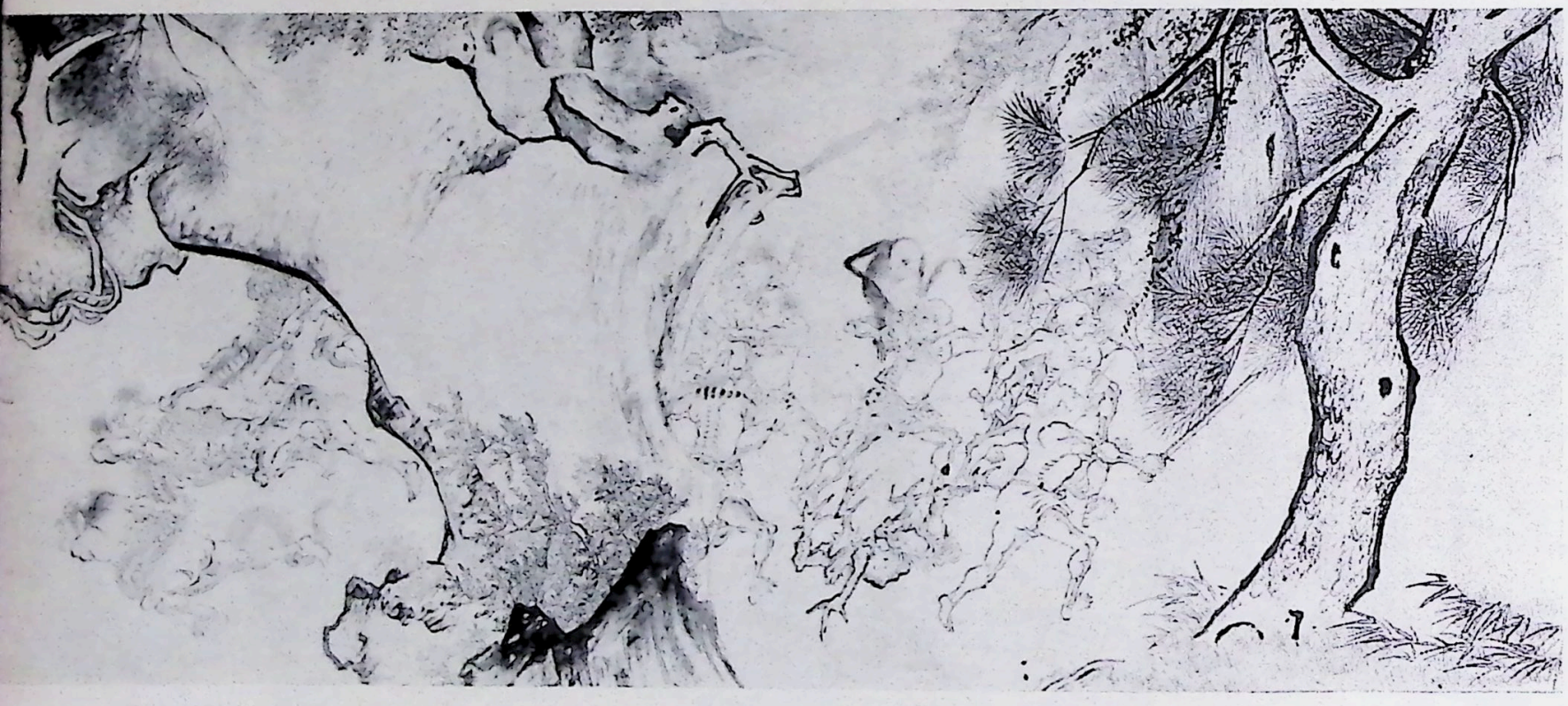
Thus, Neo-Confucianism, the last purely Asiatic development of Chinese thought, was, like all its predecessors, a rich mixture of ideas culled from various sources. Its stated objectives were reverence and the extension of knowledge as means to improving human relations in all degrees.

It has often been asked why China never produced scientists like those of Europe, or why the Chinese failed to develop scientific methods as they are known in the West. It would seem that this Neo-Confucian plan to investigate the reason of things should have led directly to such a development, yet, from the Western point of view, it failed to do so. On the other hand, it is a mist to assume that China had no science whatever, for long bef the rise of Neo-Confucianism the Chinese had made discover and recorded scientific phenomena.

Only a few of these scientific accomplishments need be no to illustrate the scope of their activities. In 240 B.C. they not the appearance of Halley's comet, and have recorded its 31 c secutive returns since then. Since 28 B.C. they have been observi sunspots ("discovered" in Europe in the 17th century). Abo the time of Christ, the year was divided into 365 385/1539 da and shortly thereafter the obliquity of the ecliptic was observ and instruments devised for its measurement.

In the third century A.D. there is evidence of their familiar with the medicinal properties of sulfur, arsenic, and mercur substances as well as with anesthetics, and in the Sung Dynas they employed inoculations for smallpox. Chinese knowledge botany was well advanced, and numerous works on the prec description of plants and their properties are to be found in t early literature.

No less astonishing were their engineering abilities. Roa involving the use of elaborate bridges and trestles were bu



The Chinese love of nature has produced artists with remarkable aptitude for lyrical depiction of natural phenomena fused with noble thoughts and ideals and supernatural divinations. The scroll detail at the left pictur the high places revered as the abode of the spirits, and emits a feel

through the most difficult mountain country; and perhaps t best-known monument to their genius for construction is t Great Wall, first completed in the third century B.C.

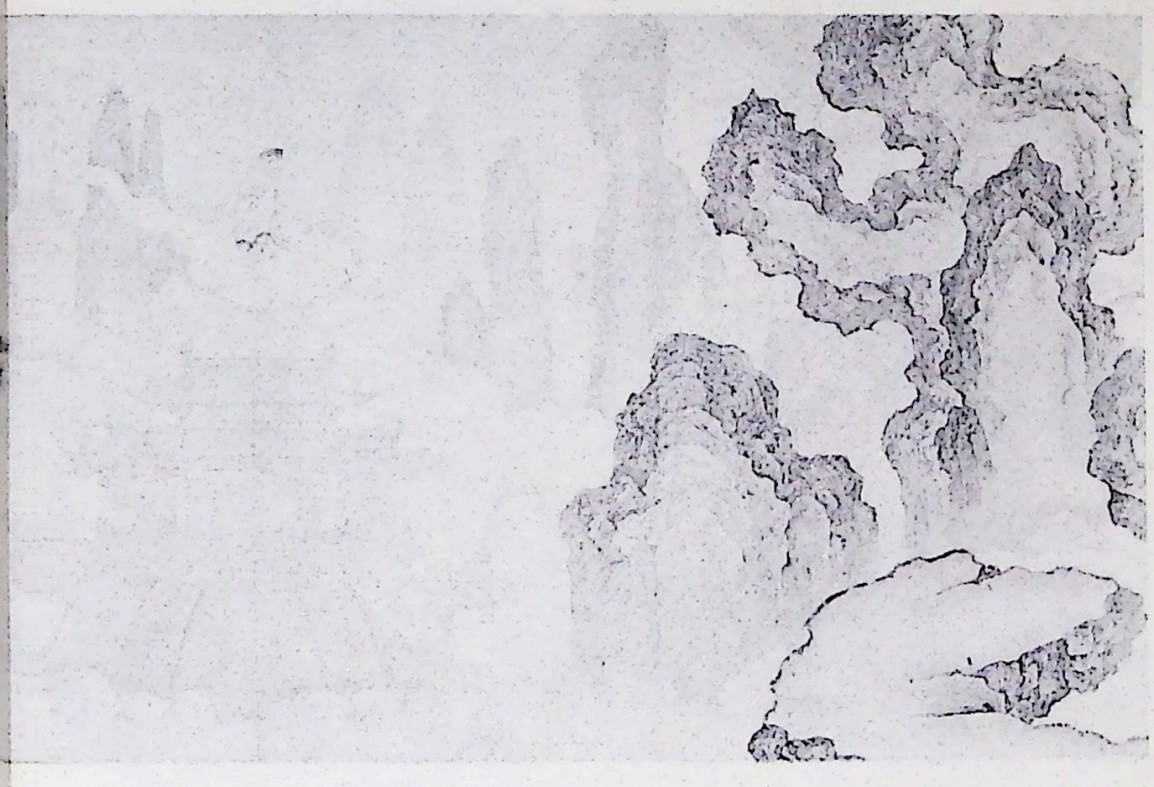
Equally remarkable are the feats of hydraulic engineerin embodied in the systems of canals, dikes, and reservoirs whi were begun in the Chou Dynasty and continued and expande with increasing skill through the centuries. One great draina system, built about 300 B.C. to eliminate floods in Szechwan, still in use. In the Sui Dynasty, canals and waterways link Lo-yang in Honan with Yang-chou near the mouth of the Lo River, and the latter city was similarly connected with Hang-hsi (Hangchow) to the south and a town near Peking in the nort

This list could be extended almost indefinitely, but enough h been said to show that China was by no means without scienti knowledge. In spite of her considerable achievements in the fie however, she did not become scientifically minded as a nati or take the final steps that would have given her scientific equali with the West.

The explanation of this failure to reach scientific maturity, to establish the fields of chemistry and physics, for instance, as they were established in Europe, and to show continued progress in them, is not entirely clear, but some tentative suggestions may be offered.

In all phases of her national life up to the overflow of the empire China has been rigidly bound by tradition. In no place is this more striking than in education, where emphasis was always on the study of the Classics. A detailed knowledge of the writings of the philosophers and the ability to write beautiful characters were the two marks of the gentleman and the scholar. Astronomy, botany, engineering, mathematics, etc., never appeared in the schools and colleges; and though there is plenty of evidence that some Chinese had considerable familiarity with one or another of these subjects, such knowledge always remained extracurricular.

Progress in scientific fields is not the product of individual genius, great as that may sometimes be, but of the constant, tireless effort, generation after generation, of a large body of men working on similar problems and recording their observations fully and precisely no matter how inconsequential they may seem at the time. In China this could not happen; the most highly



of affinity between the human spirit and the energies of the elements. The above detail indicates Chinese concern with belief in supernatural forces.

educated men did not necessarily know anything about the sciences, and had the opportunity been at hand to learn, it is probable that none but a few liberal-minded souls could have permitted themselves to depart from the rigid linguistic restrictions of the classical idiom far enough to develop the specialized scientific terminology required by such studies.

To return to the Neo-Confucians, they, like their predecessors, were hampered by tradition, and for all their great plans to examine into the reason of things, only a few could do this objectively. For the most part, the introspective methods of Buddhist thought were so deeply ingrained in them that their thinking was automatically along the lines of subjective meditation without reference to external realities.

The educational system and the language it fostered combined to limit sharply the dissemination of such scientific knowledge as there was, with the result that no group was ever built up of a size adequate to produce the results that can come only from large-scale competitive and collaborative effort.

This head of Buddha (T'ang dynasty, 618-906 A.D.), as do other artistic renderings of Guatama, radiates the inner serenity of the state of Nirvana—the state of perfect peace, the extinction of craving or passion. This is the goal of the Buddhist. In their creed there are 84,000 different ways to attain this condition, but all are based on Buddha's fundamental doctrine of the Four Noble Truths and the Eightfold Path.

The Yellow Temple, whose white ornamental stupa reflects a definite Indian influence, is located on the outskirts of Peiping. Such a temple is used for worship by Taoists, Buddhists, Siniticists and Confucianists alike. It is possible for a Chinese to be a Taoist, a Confucianist, a Siniticist and a Buddhist at the same time without being possessed by a feeling of inconsistency.

Lao-Tzu on a Water Buffalo

Lao-Tzu, born about 604 B.C., set forth his philosophies in one small book, "Way of Reason and Virtue," which became the basis of Taoism. The chief characteristic of Lao-Tzu philosophy is inactivity, quietism or non-aggression. His teachings attempted to lead people away from useless fighting and aid them in finding contentment despite inevitable poverty.

This brief sketch of the development and lack of developmen respectively of the philosophic and scientific sides of the Chines mind gives some idea of the overwhelming part played by tradition in both cases, and at the same time shows how ready they have been to accept new ideas as they became available. It shows how hard it would be to divide up the population and say so many are Confucians, so many are Taoists, and so many are Buddhists. There are vast numbers who profess to be one or the other; bu aside from a limited number of fanatics, all Chinese are undoubtedl motivated by ideas that have become inextricably interwoven i past centuries into a system that can be no more explicitly define than by calling it the Chinese way of thinking.

It should be noted that, in addition to the above-mentione schools of thought, Manicheism from Iran, Islam, Judaism, an various forms of Christianity have flourished in China to greate or less extents at various times in history. The northweste provinces today have an enormous Mohammedan population, an in recent years many converts have been made to Catholic an Protestant Christianity, though it is doubtful that they ha deeply affected the life of the people as a whole. Western scientif methods have achieved a foothold on the surface, but even und the most favorable conditions it would be a mistake to look f the overnight appearance of a modern nation fully industrialize on a scientific basis in a place where tradition has proved su an overwhelmingly powerful factor for some 3000 years. ♦

A Taoist funeral ceremo

Traditional Chinese values emphasize that the present generation is a trustee of the family and race, of ancestry and posterity. On the faces of these children, born into a life basically similar to their ancestors', one can read the tolerant, pacific and resigned acceptance of their condition and obligation. As the eldest child carries her infant brother upon her back, so tradition transports the past to the present.

Ancient China's Wisest Man

by Lin Mousheng

Confucius was the first and greatest philosopher in whom the accumulated, collective experience of ancient China found its most systematic expression. Throughout the ages he has been revered as the supreme teacher and even worshiped as a divinity. He has remained up to this time the greatest moral and rational personality that the Chinese race has ever produced. No other thinkers or statesmen have exercised such a profound influence upon the Chinese for such a long duration as has Confucius.

Born in 551 B. C., Confucius lived to the age of 72. Of noble origin but without the privileges of a title or a fief, he was the first of the rising intelligentsia that stood between the feudal ruling class on the one hand and the serf and slave class on the other. As a young man, he studied feudal institutions and conventions, thereby preparing himself for governmental service.

In his mature years he visited many a feudal state, interviewing dukes and marquises, looking for an opportunity to restore the decaying feudal order. At the age of 68, after many years of wandering, disappointed though not disillusioned, Confucius returned to the state of Lu, where he devoted the remaining years of his life to teaching and editing, and to working out a systematic philosophy.

Of the childhood and youth of Confucius little is known for certain. It is said that he was born out of an extra-marital union between Shuliang Ho, who was more than 60 years old, and a young girl of the Yen family. Soon after he was born, his father died. He was in doubt as to the place of his father's tomb because his mother for some reason had concealed the truth from him. If this story were true, Confucius as a child and youth must have suffered from a great deal of anxiety as to his own origin and must have searched for the unknown father.

The picture of Confucius the man was best drawn by the master himself:

"At 15 I set my mind upon learning; at 30 I stood firm; at 40 I was free from doubt; at 50 I understood the law of heaven; at 60 nothing that I heard disturbed me; at 70 I could follow the desires of my heart without transgressing the right."

This is an excellent autobiographical outline, showing the growth of his intellectual and moral stature. It seems that there were two significant stages. At 40 he was a wise man – having no doubts. But not until he was 70 did he become a truly good man – who could follow the desires of his heart without transgressing the right. In modern psychiatric language, he was free from mental uncertainties and anxieties at the age of 40; and at 70 he was free from moral conflicts arising from the exactions of superego and the impulses of the id.

Undoubtedly, Confucius was one of the most rational and balanced personalities of all ages. He could apparently enter into and withdraw from political life at will. Yet one cannot but observe that the mental citadel of Confucius was constantly the battleground between the will to reform the world and the desire to withdraw from it. Seeing many instances of regicides and patricides which were undermining the foundation of the social order, Confucius set out to restore the moral basis of the feudal body politic.

An escapist contemporary of his remarked that Confucius was the fellow who knew it was impossible, but who nevertheless tried, to reform the world. He firmly believed that, were he to administer a state, he would succeed in putting the political house in order within a period of three years. Yet this same optimistic Confucius advised his disciples to retire from the world: "Do not enter a tottering state, nor live in one that is rent with disorder. When righteousness prevails in the world, show your heads; but when wickedness has its way, retire into a hermitage."

In the last years of his life, Confucius apparently lived a quiet, contemplative life. As he described himself, "I am simply a man who in his eagerness for knowledge forgets his food, who in the joy of its attainment forgets his sorrow, and who does not perceive that old age is coming." Yet one cannot be certain that even in these last days Confucius was completely peaceful and resigned. The failure of his political mission weighed too heavily upon his mind for him to forget and forgive the world.

Just before his death, early one morning after he had dreamed that he was about to die – to die without having fulfilled his mission – Confucius sang the following verse:

The great mountain must crumble;
The mighty pillar must fall;
The wise man must wither away like a plant.

Much as the Socratic and Platonic, the Confucian political thought, comprehensive and profound as it is, never assumes the systematic form of an independent science or art. To Confucius, as to Socrates and Plato, politics and ethics are identical. Confucianism, both as a theory of the state and as an art of government, is essentially a morally idealistic discipline. The Confucian utopia, known as the great commonwealth *(tat'ung)*, is a state of moral perfection. The Confucian art of government consists in "putting things right." Throughout the entire body of the Confucian classics, politics and ethics are completely blended.

The word for the Confucian ethical ideal is *jen*, which etymologically, it is significant to observe, consists of two parts, "two" and "man," which therefore is best rendered into English as goodness, meaning goodness in interpersonal relations. According to Confucius, man is never a mere individual, but is always an interpersonal entity.

Before achieving goodness, Confucius thinks, a man must acquire knowledge. If to Socrates knowledge is virtue, to Confucius knowledge is the basis of goodness. The following famous passage in *Higher Education* is the best exposition of the general character of the Confucian political and ethical thought:

"The ancients who wished to preserve the clear character of the people of the world would first order their national life. Those who wished to order their national life would first regulate their

Confucius in his library

family life. Those who wished to regulate their family life would first cultivate their personal lives. Those who wished to cultivate their personal lives would first set their hearts right. Those who wished to set their hearts right would first make their wills sincere. Those who wished to make their wills sincere would first achieve true knowledge.

"When things are investigated, then true knowledge is achieved; when true knowledge is achieved, then the will becomes sincere; when the will is sincere, then the heart is set right: when the heart is set right, then the personal life is cultivated; when the personal life is cultivated, then the family life is regulated; when the family life is regulated, then the national life is orderly; when the national life is orderly, then there is peace in this world."

In this Confucian system the ruler must be a man of knowledge and virtue, for only such a ruler can regulate the family life, order the national life, and bring about peace throughout the world.

There is little difference between the state and the family in the Confucian system. The state is but a big family, the government of a state is but the government of a family writ large. The relation of the ruler to his subjects is similar to that of the father to his sons. The good ruler is a good father, the subject a good son. The principles governing political relations are substantially the same as those governing familial relations.

Practically the entire body of Confucian ethics is devoted to the problem of cultivating the mind and character of the ruler. Confucius divides men into the gentleman and the commoner class. The gentleman cultivates virtue and character, while the commoner seeks profits and goods. The gentleman understands what is right, while the commoner understands what will sell. The gentleman develops upward, while the commoner develops downward. The gentleman must learn the art of government, while the commoner is to obey but not to know.

Like Plato and Aristotle, Confucius is aristocratic by nature. In the Platonic Republic, there must be three classes – producers, warriors, and counselors and magistrates – in addition to slaves, who are excluded from citizenship. If Plato declared that until philosophers are kings, there will be no cessation of ills for states, Confucius might have said that until men of virtue and knowledge are rulers, there will be no peace throughout the world.

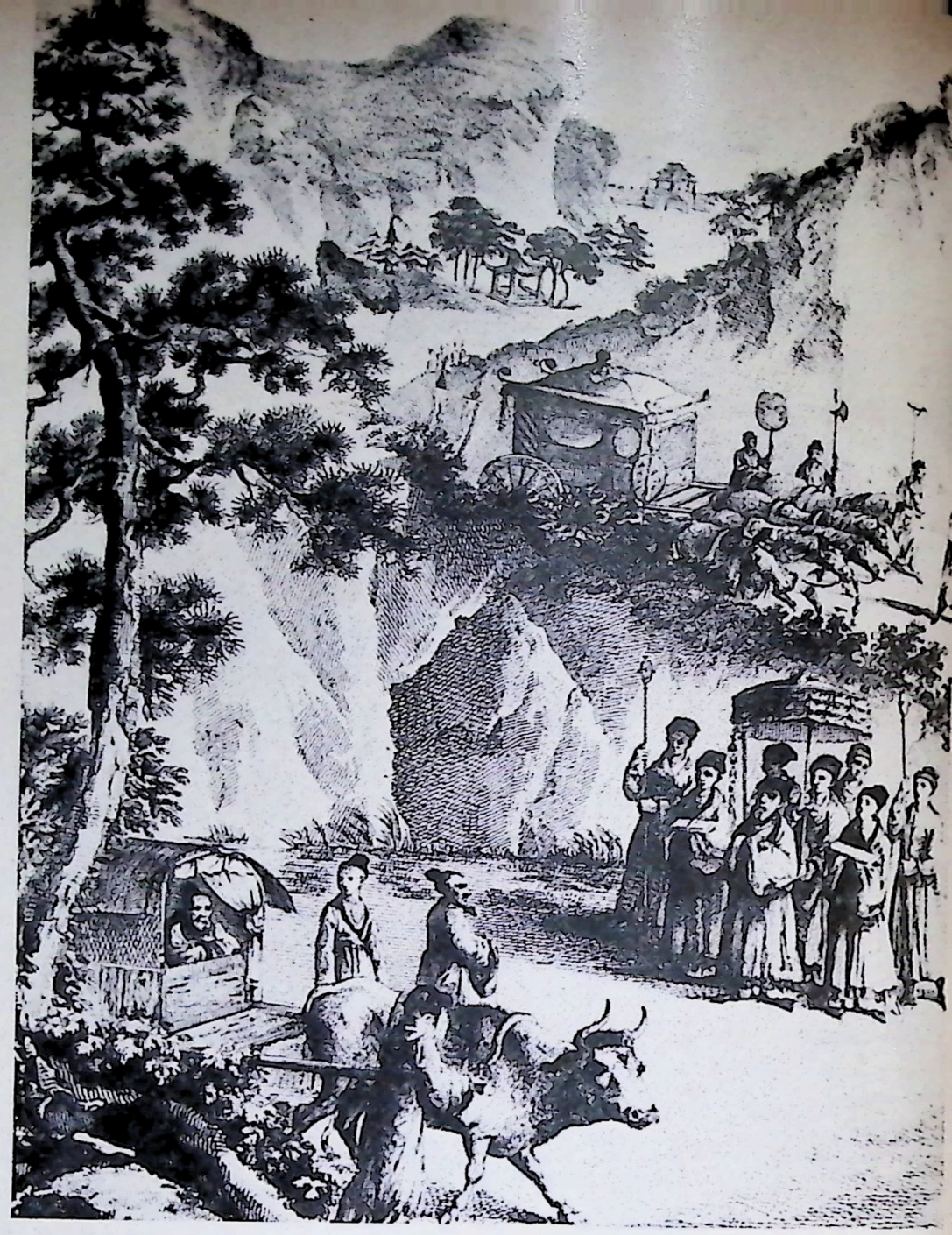
According to Aristotle, men differ in capacity, and some are by nature masters who can command and direct and some are by nature slaves who can only carry out orders. Similarly, Confucius divides men into the superior class that is naturally endowed and intellectually trained to govern, and the inferior class that can only follow and obey.

Confucius began to rationalize the feudal system as it was in the process of disintegration, just as Plato and Aristotle began to analyze and classify the principles of a political life that was fast waning. Confucius was a great admirer of the Duke of Chou, the real organizer of the feudal system, just as Plato, and to a less extent Aristotle, fell under the influence of Lycurgus and Solon, lawgivers of Sparta and Athens respectively.

As a result, both the Confucian and the Platonic and Aristotelean political philosophies were explications of the past rather than anticipations of the future.

Yet it would be difficult to overestimate the influence of these pioneer thinkers upon later centuries. Throughout the middle ages and even in modern times, Plato and Aristotle have exercised a philosophic influence than which there is none greater. Confucianism is still a predominant pattern of political thought in China today, two millennia after the extinction of the feudal regime.

So retrospective is the philosophic gaze of man and so leisurely in fact is the movement of society that these ancient philosophers loom large on the horizon of modern consciousness. ♦



The ideas and teachings of Confucius had a profound effect upon the Chinese race. Confucius tried to counsel the princes of many of the Chinese provinces. He wished them to adopt his ideals of morality, tolerance and understanding in their political leadership. Here Confucius and his disciples meet a prince on one of their many journeys.

The grave of Confucius is in a large rectangle separated from the rest of the K'ung cemetery, outside the city of K'iuh-fow. When their beloved teacher died, his disciples mourned for three years.

from the Wisdom of CONFUCIUS

Look at the means which a man employs; consider his motives; observe his pleasures. A man simply cannot conceal himself!

Great Man, being universal in his outlook, is impartial;
Petty man, being partial, is not universal in outlook.

Shall I tell you what knowledge is? It is to know both what one knows and what one does not know.

A man who lacks reliability is utterly useless.

I cannot stand the sight of an overseer who is not indulgent; of a ceremonious act which is not carried out respectfully; of failure to show grief at a funeral.

Wealth and honors are what men desire; but if they become undeserved, don't keep them. Poverty and low estate are what men dislike; but if they come undeserved, don't flee them.

Great Man cherishes excellence; Petty Man, his own comfort. Great Man cherishes the rules and regulations; Petty Man, special favors.

He who engages solely in self-interested actions will make himself many enemies.

Do not worry about not holding high position; worry rather about playing your proper role. Worry not that no one knows of you; seek to be worth knowing.

When you see a man of the highest caliber, give thought to attaining his stature. When you see one who is not, go home and conduct a self examination.

When strict with oneself one rarely fails.

Great Man seeks to be slow of speech but quick of action.

He was diligent and fond of learning, and he did not blush to learn from his inferiors. That is why he was called Cultured.

Four virtues characteristic of Great Man: humility, respect for superiors, graciousness toward dependents, and a sense of justice toward subordinates.

Man's life span depends upon his uprightness. He who goes on living without it escapes disaster only by good fortune.

A commander may be snatched away from his army, but will cannot be taken from the humblest man.

Wisdom has no doubts. Manhood-at-its-best has no concerns. Courage is without fear.

If a man has rendered himself correct, he will have no trouble governing. If he cannot render himself correct, how can he correct others?

The gentleman who prefers his own ease is no gentleman.

To feel no resentment though poor is difficult; not to be proud though rich is easy.

Great Man reaches complete understanding of the main issues;
Petty Man reaches complete understanding of the minute details.

Great Man is sparing in words but prodigal in deeds.

Be not concerned over men's not knowing of you; be concerned rather over your failings.

A steed is not praised for its might, but for its thoroughbred quality.

Not to be obedient while a child; not to set a good example when grown up; and not to die when one has grown old: this is to be a source of decay.

Not to alter one's faults is to be faulty indeed.

Those who follow different roads cannot take counsel with one another.

There are nine things of which Great Man must be mindful: to see when he looks, to hear when he listens, to have a facial expression of gentleness, to have an attitude of humility, to be loyal in speech, to be respectful in service, to inquire when in doubt, to think of the difficulties when angry, to think of justice when he sees an advantage.

In our natures we approximate one another; habits put us further and further apart. The only ones who do not change are sages and idiots.

I certainly give full approval to the gentleman who in the face of peril offers his life; who, when about to acquire something, thinks of right; who keeps respect in mind as he sacrifices, and grief in mind as he mourns.

He who is daily conscious of his lacks and every month checks to see that he is neglecting none of his abilities—that man is indeed fond of learning.

CANDLES IN THE DARK

by Charles L. Anspach

In the course of events and in the affairs of men there come times when it is essential that there be "candles-in-the-dark." Fortunately when such times of crisis arise, there are men capable of leading the people out of the darkness.

As one turns the pages of history, he meets these persons face-to-face. If one starts his review with the beginning of the world record, he is greeted by an unlimited number of marchers who lived and worked for a better world. We turn a few pages and meet just a few people who have lighted the darkness.

The destiny of the United States was partially determined by the writers of the Mayflower Compact. Finding themselves in difficult surroundings in England and longing for greater freedom they moved, though forbidden by the British Crown, to Holland. Disappointed with their surroundings and not wishing to bring their children up as Hollanders, they turned their eyes toward America. Tales of the hardships of life in the new land, stories of the bad treatment accorded the settlers by the Indians, fear of shipwreck and fear of famine cooled their enthusiasm and dampened their courage. Their answer to these discouragements is reported by William Bradford: "It was answered that all great and honorable actions are accompanied with great difficulties, and must be both enterprised and overcome with answerable courage." It is assumed that among those who lighted candles which clarified the way was this same William Bradford who later became Governor of their colony.

So clear was their vision and so staunch their courage that they in the words of Dr. Daniel L. Marsh, "stayed (in their homes) because they were able to see the eternal in the temporal, and the invisible in the visible, and because among them the material was dominated by the spiritual."

Later these people who came in a search for religious freedom, restricted such freedom, and a voice again became a guiding light in establishing the American way of life. Roger Williams insisted on the separation of church and state. So great was his influence that it was said, "There was a whole country in America like to be set on fire by the rapid motion of a windmill in the head of one particular man." He lighted a candle which illuminated the way for the civil democratic state with freedom of religious thought.

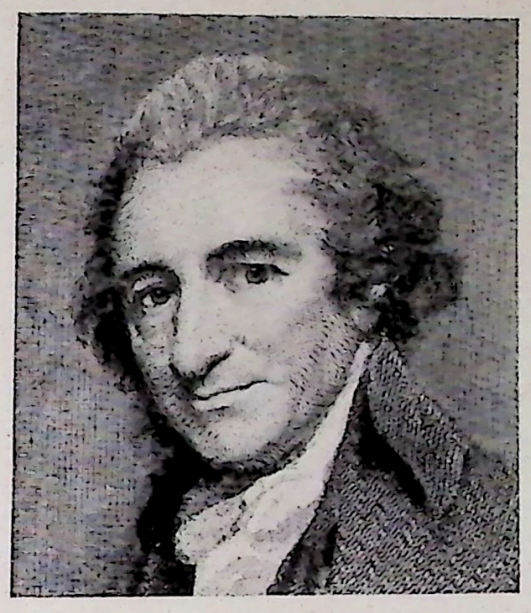
Time marches on. In the days of the revolution Thomas Paine through his writings, *Common Sense* and *The Rights of Man*, in the words of George Washington, brought about a "powerful change in the minds of the people of Virginia." The candle lighted by him in that early period still burns brightly, for we are still living in days that "try the souls of men."

Encouraged through finding the way lighted by such writings, one of the world's greatest documents was born, the Declaration of Independence. Fired by the courage and conviction of a Patrick Henry, and aided by the genius of a Thomas Jefferson, and supported by the good judgment and the wisdom of George Washington, Benjamin Franklin and others, we could declare with faith and confidence, "We hold these truths to be self evident." Today that candle lighted by men shines in a dark world and still points the way to the God given rights which make men free.

Years later, darkness again settled over the land. There were some who remembered that men are created equal, but it was given to a man of humility to light the way once more, with the words, "Fourscore and seven years ago our fathers brought forth on this continent a new nation, conceived in liberty, and dedicated to the proposition that all men are created equal." Once again the principle of freedom was reborn. It took a very lonely man but a great man to bring light again to the world.

Again men were uncertain and like the children of Israel

ROGER WILLIAMS *(1603-1683) was a clergyman and an advocate of religious freedom. He was the founder of Rhode Island which began as a democratic refuge from religious persecution. He insisted on the separation of the church and the state, declaring that civil magistrates had no power over matters of conscience.*



THOMAS PAINE *(1737-1809) was born in Norfolk, England. His father was a Quaker and his upbringing was strict. After his migration to America he began writing his books advocating the "natural" or inherent rights of man.*

wandered in the wilderness of uncertainty and doubt. And then from the lips of the New Jersey Schoolmaster President came the words, "Ours is a reign of law, enacted with the consent of the governed and enforced by public opinion." A candle had been lighted and a people moved forward.

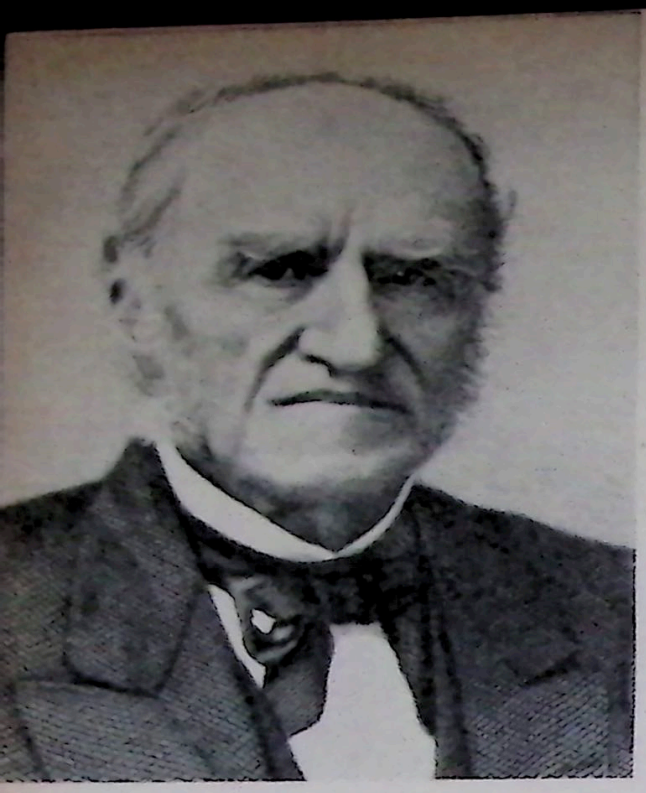
Mention has been made of just a few keepers of the light who have pointed the way to our national greatness. There are hundreds, yea, thousands who have lived for a better world. Time prevents the listing of those known to all of us as the great who gave that we might have a good life. The fields of science, religion, the arts, literature, philosophy and other disciplines could nominate to our Hall of Fame.

Mention should be made, however, of several others who worked for the general good. I pay tribute now to two of the world's illustrious. These two were teachers. We associate great teaching with the name of one. For many years we have said, "Mark Hopkins on one end of a log and a student on the other constitute a university." We understand this high tribute to Mark Hopkins when we hear his words, "The outcome of a college training ought to be a sound body, a disciplined mind, a liberal education, a right character.

"He who carries the torchlight into the recesses of science, and shows the gems that are sparkling there, must not be a mere hired conductor, who is to bow in one company, and bow out another, and show what is to be seen with a heartless indifference, but must have an everliving fountain of emotion that will flow afresh as he contemplates anew the words of God and the great principles of truth and duty."

The other, Louis Braille, blinded early in his youth, invented the dot system we call the Braille method of reading. He developed the system that the blind "might evolve personalities as natural

PATRICK HENRY *(1736-1799) is perhaps the most famous of all American patriots. As an orator he knew no equal, and fought for individual liberty for all Americans. His most famous words are: "Give me liberty or give me death."*



MARK HOPKINS *(1802-1887) was renowned as a great teacher and administrator. His literary works were a source of inspiration to the students of his time, and he is considered one of the greatest American educators.*

LOUIS BRAILLE *(1809-1852) was blinded in an accident at the age of three. Overcoming great personal handicaps he devised the Braille system of reading and writing for the blind.*

HELEN ADAMS KELLER, *born in 1880, was blind and deaf from the age of two. Her parents did not hold any hope of a normal life for their child. At seven she was placed under the charge of Anne Sullivan who taught her to read and write. Helen Keller's courage has been an inspiration to the entire world. She is an accomplished author and lecturer.*

and resourceful as those of the seeing." The candle he lighted ha been a light unto the pathway of countless thousands. The signifi cance of that light is attested in these words of Helen Keller wh walked in the darkness and then found her way lighted: "The world around me shone afresh with treasures of poetry and thought of philosophy, history and literature in other lands. Enraptured I sensed my membership in the human race anew and welcomed the 'congress of the great, the wise, the hearing eyes, the seeing eyes.'"

Tribute must also be paid to one other. Crossing all boundaries of geography, time and race, is the light of Him who knows all and sees all and Whom to know is life eternal. The candle He lighted nineteen hundred plus years ago has guided men into the paths of goodness and greatness. His truth shall forever go marching on.

These are just a few of the many who were candles-in-the-dark. You know the names of many others. Why do men assume the role of "candles-in-the-dark?" There may be many reasons but of these I am certain:

One—life can have meaning only in terms of fulfillment. A candle has value as an ornament, as an item to decorate a room. It may be a thing of beauty but its real usefulness can find expression only in its burning, which furnishes light, good cheer and comfort. It finds meaning and fulfills its purpose in giving of itself.

A human life like a candle can be an ornament, it can be admired for its potentialities, it can be a thing of beauty, but actually its real purpose is found only in the giving of itself. Life has meaning when it is given away. Tagore, the Indian poet, sensed this when he said, "We earn life when we give it away."

The great I have referred to were willing to give of themselves. They were not afraid to risk their all in the attempt to make a better world. It is significant when the crisis times came they were able to analyze the situations, point to possible solutions, give direction and undergird courage.

It is also true that when one tries to furnish light for the pathway of another that he frequently sees the path more clearly and finds the way easier. When one helps another he gains, for that which he gives returns many fold.

Two – it is a sign of greatness when courage and conviction find expression in action. Lives are moved by the declarations of those who steadfastly set their faces toward definite goals. Patrick Henry declared, "I know not what course others shall take but as for me . . ." Abraham Lincoln said, "Sometime I shall strike this thing . . . with malice toward none, with charity for all . . . let us finish the work." The young officer on the battlefield when ordered to retreat said, "Retreat! Never. We just got here."

Steadfastly setting one's face means that one is in position to overcome discouragement, to conquer self pity and to direct oneself toward the objective goal. Being human we tire easily, we become confused by issues, we get hopelessly entangled in our own reasoning and faltering methods of communication to the end that our vision becomes clouded and our objective blurred. And then a leader lights a candle and we see again.

Three – they were disciples of the enforceable. I do not know who first described the highest level of behavior as being on the level of the unenforceable but I subscribe to the idea. Most of life is lived on the level of the enforceable. We conform to regulation to law, to custom, to tradition, to public opinion. We are good because we must be good, or we behave on higher levels because we have learned it pays to do so. The end of such conformity is personal gain and satisfaction.

The doing of more than is expected; the going out of one's way for another; the doing of good just for the sake of doing good without expecting any personal gain; and the expenditure of time, money and effort without the knowledge of others in the

WOODROW WILSON *(1856-1924) was the 27th President of the United States. As president of Princeton University he gained a reputation as a great orator and fought for many reforms in the educational system. This experience stood him in good stead during his Presidential term in World War I. After peace had been declared he worked for a new world society which would be governed by the "self-determination of people."*

interest of the common good, are on the level of the unenforceable. There is no person, group or power requiring such behavior.

In community, national and international affairs, there are those who work for the betterment of mankind and in the common cause, knowing that their motives may be misinterpreted and that their only remuneration will be the satisfaction coming to those who measure up to the stature of men and women and approach the ideal set for God's noblemen and noblewomen.

One can live on a low plane, but if he does he will never realize the full meaning of life or attain the true measure of manhood. Only those who light candles-in-the-dark can know the inner satisfaction which comes to the disciples of the unenforceable.

Four – they accepted the obligation of *noblesse oblige* – persons of noble rank should behave nobly. There is nothing new about the idea of living up to the obligation of rank. Our parents often place great emphasis on living up to the family's good name and acquitting ourselves in such a manner as to bring honor to the family. When one holds a position of honor in government a behavior code must be recognized.

You may feel that as a single person you can do no good. It was said long ago, "It is better to light one candle than to curse the darkness." The lighting of one candle may seem insignificant but in certain times and circumstances it brings light to the pathway and gives hope to the traveler. Also, if enough candles are lighted the circle of light is extended and horizons are broadened. You may remember when you were a child of your participation in a candle lighting service. One candle is used to light another, that one lights another and so on until the room is aglow with candle light. So it is with the light of a single person. His light touches others and life is changed through an endless chain of human contacts.

You are a single human being but no one today can adequately measure to the full the influence of your life if it reaches complete fulfillment. To you is given the obligation of doing your duty as a giver of light. "You are the heirs of all the ages." You must add to the heritage. This is your obligation. To you is given the privilege of lighting candles. ◆

THEIR LAST WORDS

BENEDICT ARNOLD *(calling for his old Continental uniform of a major general)* Let me die in my old uniform. God forgive me for ever putting on any other.

JOHN WILKES BOOTH Tell my mother—I died—for my country . . . I thought I did for the best . . . Useless! Useless!

SAINT DOMINIC Let not my departure in the flesh trouble you, my sons, and doubt not that I shall serve you better dead than alive!

PAUL LAURENCE DUNBAR *(Negro poet)* Through the valley of the shadow.

JOEL CHANDLER HARRIS *(creator of Uncle Remus)* I am about the extent of a tenth of a gnat's eyebrow better.

THOMAS HOBBES I shall be glad to find a hole to creep out of the world at.

LEIGH HUNT I don't think I shall get over this.

WASHINGTON IRVING Well, I must arrange my pillows for another weary night! When will this end?

JOSEPH LAKANAL *(educator; to the doctor)* Your attentions will not save me; I feel that there is no more oil in the lamp.

PATRICK HENRY Be thankful for the kind God who allows me to go thus painlessly.

SIR WALTER RALEIGH *(to the executioner)* What dost thou fear? Strike, man, strike!

COMMODORE JOHN RODGERS Butler, do you know the Lord's Prayer? . . . Then repeat it for me.

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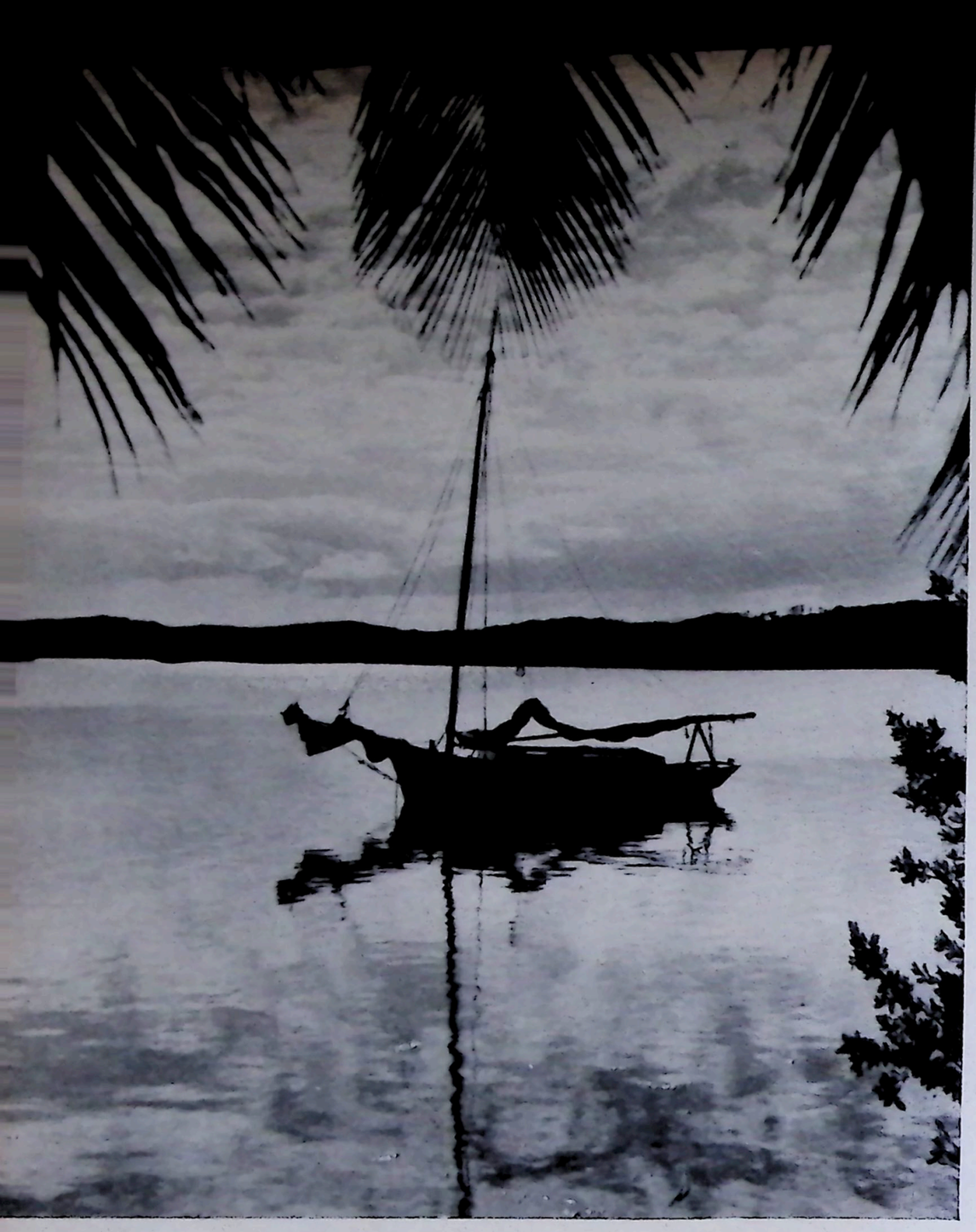

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DON HEROLD: It takes a lot of things to prove you are smart, but only one thing to prove you are ignorant.

* *

ABRAHAM LINCOLN: It has been my experience that folks who have no vices have very few virtues.

* *

GEORGE ELIOT: Blessed is the man who, having nothing to say, abstains from giving wordy evidence of the fact.

* *

CHARLES CALEB COLMAN: There are three difficulties in authorship: to write anything worth the publishing, to find honest men to publish it, and to get sensible men to read it.

* *

APHRA BEHN: Money speaks sense in a language all nations understand.

* *

AMBROSE BIERCE: A prejudice is a vagrant opinion without visible means of support.

* *

JOHN CHURTON COLLINS: The secret of success in life is known only to those who have not succeeded.

* *

BENJAMIN DISRAELI: The author who speaks about his own books is almost as bad as the mother who talks about her own children.

* *

ALEXANDRE DUMAS: We blame in others only the faults by which we do not profit.

* *

FINLEY PETER DUNNE: Life would not be worth living if we didn't keep our enemies.

* *

RALPH WALDO EMERSON: Conversation is an art in which a man has all mankind for competitors.

* *

FORD COREY: She's learned to say things with her eyes that others waste time putting into words.

* *

ANATOLE FRANCE: Never lend books, for no one ever returns them; the only books I have in my library are books that other folks have lent me.

* *

ROBERT FROST: A jury consists of twelve persons chosen to decide who has the better lawyer.

* *

EDMOND DE GONCOURT: Genius is the talent of a man who is dead.

IAN HAY: Marriage is a ghastly public confession of a strictly private intention.

* *

WILLIAM HAZLITT: Silence is one great art of conversation.

* *

ELBERT HUBBARD: Don't lose faith in humanity: think of all the people in the United States who have never played you a single nasty trick.

* *

VICTOR HUGO: Everything bows to success, even grammar.

* *

OSCAR LEVANT: I've given up reading books; I find it takes my mind off myself.

Wit of Wisdom

HENRY WARD BEECHER: Every man should have a fair-sized cemetery in which to bury the faults of his friends.

* *

ROBERT BENCHLEY: Drawing on my fine command of language, I said nothing.

* *

JAMES BRYCE: Medicine is the only profession that labors incessantly to destroy the reason for its own existence.

* *

KAREL CAPEK: If dogs could talk, perhaps we'd find it just as hard to get along with them as we do with people.

* *

JEAN COCTEAU: The worst tragedy for a poet is to be admired through being misunderstood.

* *

WILLIAM COWPER: A life of ease is a difficult pursuit.

* *

WALTER LIPPMAN: When all think alike, no one thinks very much.

* *

DON MARQUIS: Middle age is the time when a man is always thinking that in a week or two he will feel as good as ever.

* *

H. L. MENCKEN: When women kiss, it always reminds me of prize fighters shaking hands.

* *

GEORGE MEREDITH: The future not being born, my friend, we will abstain from baptizing it.

* *

WILSON MIZNER: I respect faith, but doubt is what gets you an education.

* *

EDGAR ALLAN POE: I have great faith in fools; self-confidence my friends call it.

* *

WILL ROGERS: The income tax has made more liars out of the American people than gold has.

* *

ROBERT SCHUMANN: In order to compose, all you need to do is remember a tune that nobody has thought of.

* *

GEORGE BERNARD SHAW: All my life, affection has been showered upon me, and every forward step I have made has been taken in spite of it.

* *

ROBERT LOUIS STEVENSON: If we take matrimony at its lowest, we regard it as a sort of friendship recognized by the police.

* *

FRED ALLEN: I like long walks, especially when they are taken by people who annoy me.

* *

ARTHUR ("Bugs") BAER: A good neighbor is a fellow who smiles at you over the back fence but doesn't climb over it.

* *

JAMES M. BARRIE: I am not young enough to know everything.

* *

BARON LYTTON: If you wish to be loved, show more of your faults than your virtues.

* *

DOROTHY PARKER: She ran the whole gamut of her emotions from A to B.

Our constitution does not copy the laws of neighboring states; we are rather a pattern to others than imitators ourselves. Its administration favors the many instead of the few; this is why it is called a democracy. If we look to the laws, they afford equal justice to all in their private differences; if to social standing, advancement in public life falls to reputation for capacity, class considerations not being allowed to interfere with merit; nor again does poverty bar the way, if a man is able to serve the state, he is not hindered by the obscurity of his condition.

Further, we provide plenty of means for the mind to refresh itself from business. We celebrate games and sacrifices all the year round, and the elegance of our private establishments forms a daily source of pleasure and helps to banish the spleen; while the magnitude of our city draws the produce of the world into our harbor, so that to the Athenian the fruits of other countries are as familiar a luxury as those of his own.

If we turn to our military policy, there also we differ from our antagonists. We throw open our city to the world, and never by alien acts exclude foreigners from any opportunity of learning or observing, although the eyes of an enemy may occasionally profit by our liberality; trusting less in system and policy than to the native spirit of our citizens; while in education, where our rivals from their very cradles by a painful discipline seek after manliness, at Athens we live exactly as we please, and yet are just as ready to encounter every legitimate danger.

Nor are these the only points in which our city is worthy of admiration. We cultivate refinement without extravagance and knowledge without effeminacy; wealth we employ more for use than for show, and place the real disgrace of poverty not in owning to the fact but in declining the struggle against it. Our public men have, besides politics, their private affairs to attend to, and our ordinary citizens, though occupied with the pursuits of industry, are still fair judges of public matters; for, unlike any other nation, regarding him who takes no part in these duties not as unambitious but as useless, we Athenians are able to judge at all events if we cannot originate, and instead of looking on discussion as a stumbling-block in the way of action, we think it an indispensable preliminary to any wise action at all.

Again, in our enterprises we present the singular spectacle of daring and deliberation, each carried to its highest point, and both united in the same persons; although usually decision is the fruit of ignorance, hesitation of reflexion. But the palm of courage will surely be adjudged most justly to those who best know the difference between hardship and pleasure and yet are never tempted to shrink from danger.

In generosity we are equally singular, acquiring our friends by conferring, not by receiving favors. Yet, of course, the doer of the favor is the firmer friend of the two, in order by continued kindness to keep the recipient in his debt; while the debtor feels less keenly from the very consciousness that the return he makes will be a payment, not a free gift. And it is only the Athenians who, fearless of consequences, confer their benefits not from calculations of expediency, but in the confidence of liberality. ♦

men and ideas

THUCYDIDES

Thucydides (fifth century, B.C.) is generally considered one of the world's foremost historians and thinkers. Like Toynbee in our time, he developed a philosophical view of history. This portion of the account of the funeral oration by Pericles as reported by Thucydides in "The Peloponnesian War" is a classic of simplicity and summarizes the lofty ideals of Athenian life.

ARNOLD J. TOYNBEE . . .

World Historian

Arnold Toynbee is generally regarded as one of the foremost living historians. His reputation rests upon his profound knowledge and his ability to interpret the crucial issues of the past and the present.

Toynbee's *Study of History* compares with such works as St. Augustine's *City of God* and Spengler's *Decline of the West.* In this work Toynbee poses fundamental questions which relate to the nature and destiny of man; for example, what is the meaning of history? What causes the rise and decline of civilizations? What are the most important factors which shape the future of man?

Toynbee believes that history can be interpreted in psychological terms. A civilization responds to a challenge and when its response is creative, it is in a state of growth and prosperity. Some challenges can be so severe, as for example in the case of the Eskimos, that no adequate development can take place. Progress occurs when real spirituality exists and when the responses are *internal rather than external.*

With a strong religious faith, Toynbee believes that the accomplishments of the great saints are more important than the attainments of scientists and statesmen. He looks forward to a period when the ideals of the New Testament shall be realized; he feels that the decline of civilizations is due to their inability to respond to the spiritual challenges of their time.

What constitutes the breakdown of civilizations? What causes their failure? Toynbee maintains that above all it is a failure of self-determination. In a period of decline the creative minority becomes a dominant minority. Instead of creativity, the idea of imitation is cherished. There are contradictions within society, both an internal and external proletariat are dissatisfied with existing conditions.

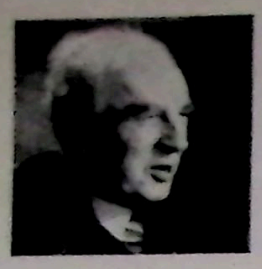
In a period of decline some individuals live too much in the past, others have too much faith in the future. There is too much reliance upon an absolute leader. Disintegration, according to Toynbee, does not take place uniformly but proceeds by routs and rallies.

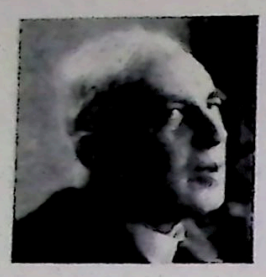
To Toynbee, militarism is one of the earmarks of decline. When a civilization emphasizes force above peace and when it relies too much upon armaments, the door is open to defeat. Toynbee, like the ancient prophets, feels that to live by the sword is to die by the sword.

The question emerges now: Is the decline of the West inevitable? Are we living in a period of disintegration? Toynbee answers that history is not a deterministic process and that there is hope for the West if we live up to our spiritual heritage.

Toynbee's major importance lies in his perspective and detachment. Reading his *Study of History* is not an invitation to despair or to resignation, but an incentive to intelligent re-examination and to a more meaningful philosophy of life. ♦

Arnold J. Toynbee





Conversation with a Historian

Distinguished British historian Arnold J. Toynbee was interviewed by Christopher Wright of Harvard for the National Broadcasting Company's "Conversations", a filmed series of interviews with outstanding personalities of our time. From his remarks about his latest volumes and his general theories of history, WISDOM *has selected the following questions and answers to provide further insight to his philosophy.*

How long did it take you to write your "Study of History?"

It took me 27 years. Of course, out of that came a bite of seven years, bitten out by the Second World War. But it's amusing to think of when I had my notes all written out, I thought that I'd polish it off in two summers, and it took me 27 years.

I suppose you wrote most of it in London?

I did write four volumes, since the war, in London – at least most of them. I wrote part in Princeton, New Jersey, and quite a good bit on the ocean, going to and fro. Now six other volumes – I wrote most of them up in Yorkshire. I have perhaps a greater feeling for Yorkshire than I have for London. I have great feeling for places in Italy or Greece, but London somehow is the place where I have to do the main part of my work, I always find.

I've often wondered: just how did you get started on this enterprise?

I think the explanation is really my mother. Not that she suggested it, but she just was an historian herself and I grew up assuming that I was going to be one, too, because of her. She was in one of the first class of women to take a university course at Cambridge, England, and when I was small and she used to put me to bed at night, she used to tell me the history of England in bits, till after about a year we finally had gone all through it.

How did you become an historian? I suppose it was your mother's influence, wasn't it?

I'm sure it was my mother. But, of course, at one stage, anyway, that was rather overlaid by my school, because I went to a very old-fashioned school, Winchester, founded at the end of the fourteenth century. They had what was then a very up-to-date sixteenth century classical education, which I still came in for. You know, translating bits of English into Latin and Greek. It's rather surprising how what seemed like rather a narrow form of education did broaden one out there. My master thought that Emerson was just the thing to translate into Platonic Greek prose, so that introduced Emerson to me.

In your youth you really lived in the past a great deal then, didn't you?

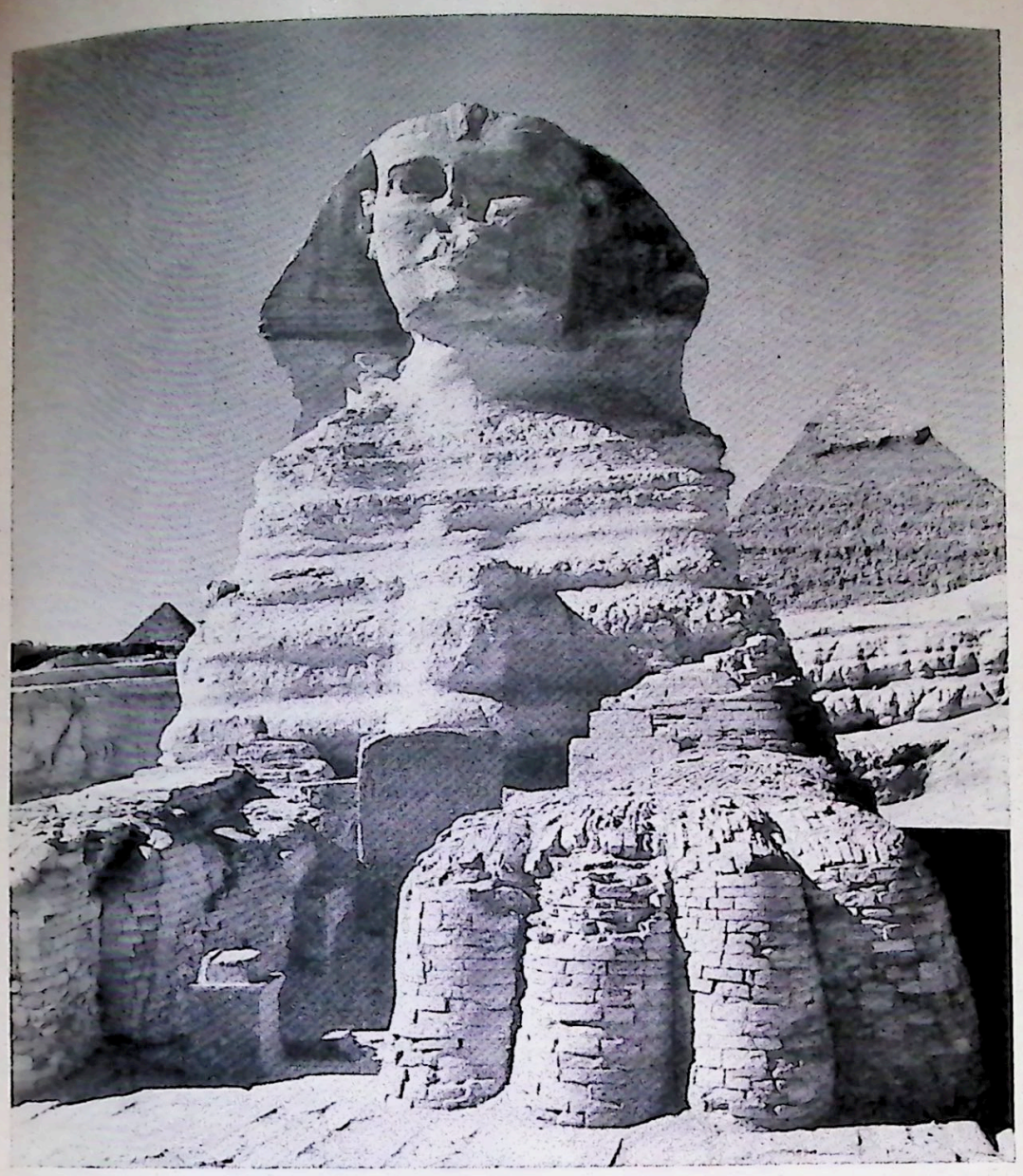
I did, I suppose, but the funny thing is that the past then let me back into the present. I'm thinking of my first visit to Greece. That was in 1911, a year before the Balkan War. I went to Greece just to study ancient history – had no notion of the modern world – and that visit to Greece for ancient history . . . well, it put the modern world into the center of the picture for me.

Couldn't it be argued that your "Study of History" is the kind of thing that could have been done by a group of people? Why'd you have to do it all yourself?

I don't believe a committee can write a book. There are all kinds of things a committee can do. It can govern a country, perhaps, but I don't believe it can write a book. I think a book has to be written by some single mind. But, of course, that's a very large and formidable undertaking, and I think if a writer is wise, he gets all the help he can from other people. The responsibility is on him, it must pass through his mind, but he takes help where he can get it.

I learned a good deal about this from writing the survey of international affairs and then applied it to the other book, the *Study of History* – learned how to get critics' opinions on your work before you publish, when it's not too late to change, instead of waiting until they've reviewed your book and slayed it. I've

EGYPTIAN

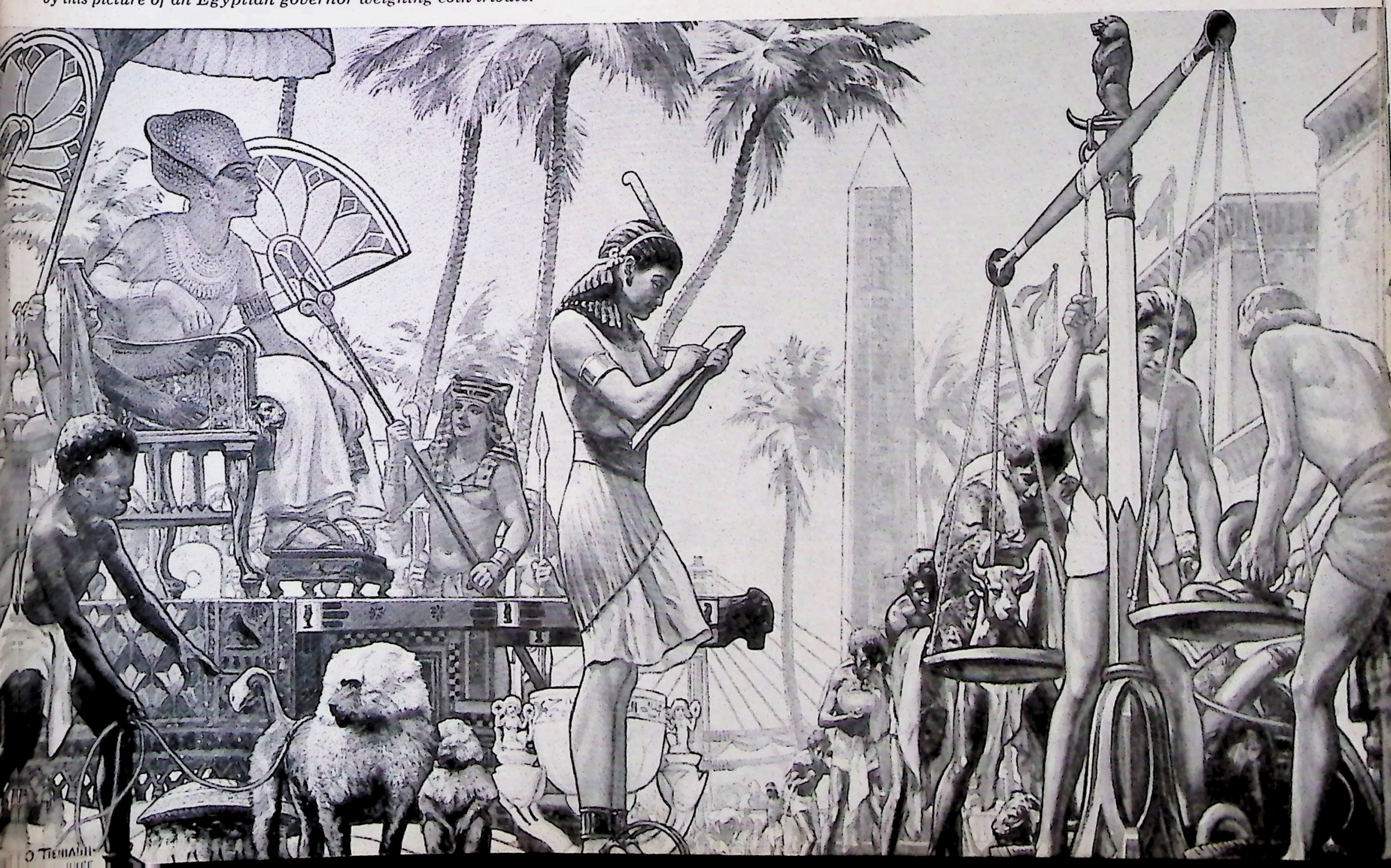


There are approximately 30 great civilizations which Toynbee regards as important in the course of man. Twenty-one have run their natural and complete, or almost complete, life. Of these, five "original" civilizations have emerged and flowered, and the other 16 are related in the sense that they grew out of the embers and traditions of the earlier civilizations. Toynbee's five originals, illustrated on this and the following pages, are Egyptian, Sumerian, Mayan, Chinese and Indic.

Hellenic civilization, according to Toynbee, is important because its spirit and ideas have molded the Western mind. Our concept of law, our view of democracy, our faith in the dignity of man, our artistic ideals, our scientific method, our search for truth – all these achievements owe a debt to Hellenic culture.

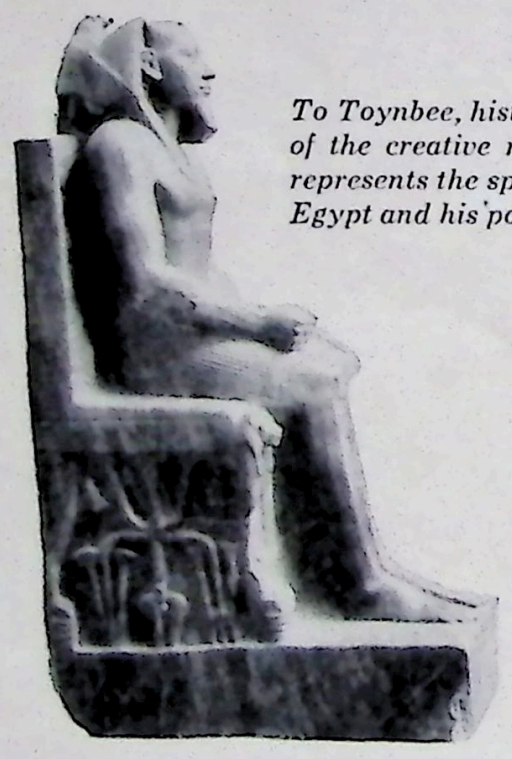
To Toynbee, man's destiny contains an element of "unfathomable and incalculable mystery." This spirit is manifested in the great Sphinx, regarded as one of the most important contributions of Egyptian Art. Archeologists and art historians are uncertain as to who built this monument, but critics generally applaud its splendor and magnificence.

The weakness of ancient Egypt was an inadequate governmental structure. As in other civilizations, there developed both an internal and external proletariat. By the word proletariat, Toynbee refers to "any social element or group which in some way is 'in' but not 'of' any given society at any point of that society's history." The exploitation of the poor is represented by this picture of an Egyptian governor weighing coin tribute.



EGYPTIAN

One of the important manifestations of civilization is man's unending quest for immortality. An enduring symbol of this quest is the Cheops pyramid which is portrayed in this reproduction. "It seems probable," Toynbee states, "that the pyramids which have already borne inanimate witness to the existence of their creators for nearly five thousand years, will survive for hundreds of thousands of years to come. It is not inconceivable that they may outlast man himself . . ."



To Toynbee, history above all is the story of the creative minority. King Khafre represents the spirit of this group in ancient Egypt and his portrait has an ageless charm.

Too many historians, Toynbee believes, emphasize the importance of technology. In contemporary Egypt, as this picture indicates, ancient modes of transportation are still being used and the life and appearance of the people are not too different from the customs and dress of centuries ago.

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applied that quite a lot to parts of the *Study* where I felt I was out of my depth or where the ground was particularly delicate.

But then I'm thinking of all the wonderful work in details that's been done in recent times by not only our historians but by the orientalists and by the archeologists, and how enormous the amount of use I have made of that. So I would say that one man must do it, but if he is sensible he will take help where he can find it.

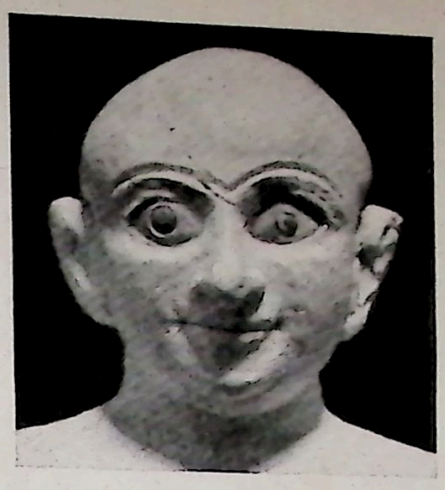
You don't think there could be any single definitive study of history then?

I don't, because history is always on the move. The other day, reading my newspaper and following what Mr. Dulles and Mr. Eden were doing, I had my other eye on what the archeologists were doing, because they were turning the history of the second millenium B.C. upside down by uncovering a new ancient site in Anatolia, and it was moving almost faster than the twentieth century was.

You mean, then, history really is an accumulation of past experience for modern day use?

Yes. History not used is nothing, for all intellectual life is action, like practical life, and if you don't use the stuff – well, it might as well be dead.

SUMERIAN

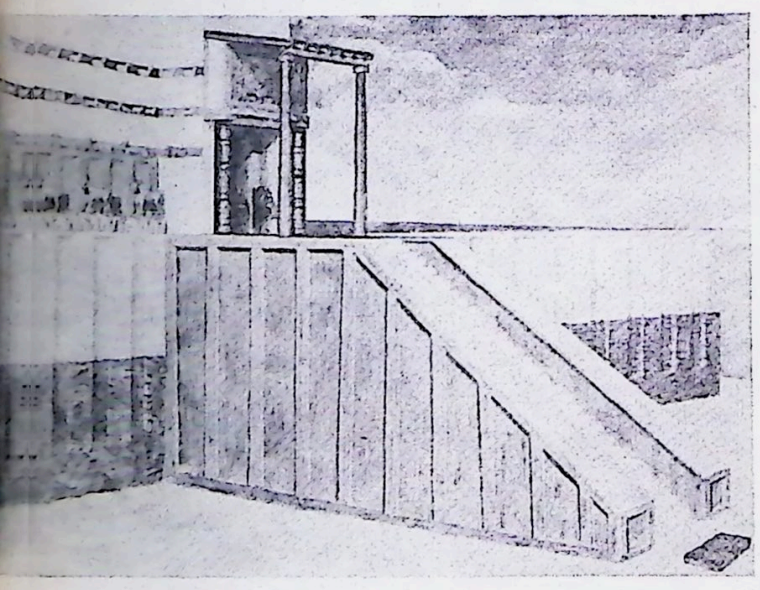


The English historian feels that the past is generally the story of a minority which may be either benevolent or coercive. When the creative minority becomes authoritarian, decline usually sets in. In this reproduction of a Sumerian dignitary, we find a strong emphasis upon power and his features indicate that he was a man of firm convictions.

The great challenges are spiritual and intellectual. The use of the clay tablet was a response to an intellectual challenge and it made possible a more rational foundation of civilization.

This sculpture of a Sumerian worshiper, 4700 years old, reveals man's humility in his religion.

The Sumerians were great adapters. In this reconstruction of one of their temples, we find many elements which are taken from other civilizations. This temple was erected during the First dynasty around 2900 B.C.



The story of civilization is concerned not merely with practical matters but with the unessential. Man's love of beauty finds an expression in luxurious ornamentation. This reproduction of a Sumerian queen shows her love for exotic jewelry.

It sounds as if you couldn't have done your "Study of History" without your work on current affairs.

No. Well, after all, the only time you can catch people alive is in your own time, when you are living. And if you can catch them alive there and study them in life – well, then, perhaps you can bring them alive in 1000 B.C. or 2000 B.C. But if you can't study living people and know what they're like, you can't study human beings at any time.

I understand the personal element in any historian's analysis of history, but there must be a scientific element, too – discovery of some patterns?

That's a point that people get pretty excited about nowadays. As you know, there's quite a dispute about that. I suppose by "science" one means a discovery and understanding of regularities and uniformities – recurrences – what the scientists call laws. And some historians just deny that there are any such regularities and uniformities in human affairs. They say history doesn't repeat itself.

Yet I am rather a heretic about that. I believe that it partly does repeat itself. I believe you can discover a certain number of uniformities in past history.

At the same time, I am not a determinist and I don't believe we have no free will, and I don't believe past patterns just foretell and foredoom the future. I think there's an element of freedom and an element of patterns, and both elements must be considered before we can predict the future.

MAYAN

According to the English historian, actuality is less important than man's aspirations and dreams which are best represented in artistic creativity. This reproduction of a Mayan stone head manifests excellent technique and an ability to use the material with skilled proficiency.

This model of the Mayan city of Tikal, showing a religious ceremony, depicts a community which prospered about 1600 years ago. According to archeologists the city consisted of over 100 public buildings, including many temples. Toynbee notes that Mayan life alternated between asceticism and a frank enjoyment of life.

The Mayans contrasted between the periods of growth and disintegration. When Mayan civilization was at its height, it had great cities as this illustration indicates, and its art and architecture were on a high level. Religion played an important part in the Mayan way of life and it was the source of much of Mayan artistic creativity.

Just what is your theory of history?

That's a large question. I suppose I started off by finding I couldn't work with nations as units of historical study. Most people in our time work with nations. I found them too small and felt they were somehow fragments of something bigger which I had to reach after. So I reached after civilizations. For instance, not seeing things in terms just of American history or French history or Italian history, but seeing it in terms of Western history, then in Greek history or Indian history, and so on – these large units, about 20 of them.

And then I began to study their anatomy and their life history, so to speak, and I found, as I thought, that a number of them had broken down and gone to pieces, and that had happened to them on a certain pattern, but that didn't make me a determinist because it didn't make me believe that is bound to happen to every civilization, such as ours which is still alive. But it did make me feel that there was a great challenge to any civilization that showed the symptoms of breaking down, as ours fairly does today. But I do believe that we are free to a very large extent to settle our own fate.

But I didn't end with civilizations, because when you study

The Mayan pyramids represent the religious beliefs of an ancient civilization. In this reproduction of El Castillo, Chichen Itza, Mexico, a geometrical pattern can be seen. The structure of the pyramid indicates a high degree of engineering skill and beauty.

The Mayans today, according to Toynbee, illustrate the "transitoriness of human achievement." Compared with earlier times, the Mayans are not producing great art or outstanding political organizations. Some of the ancient traditions and handicrafts continue today. This picture of a Mayan girl shows ways of the past being perpetuated.

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the breakdowns of civilizations in the past and their collisions with one another, you find yourself coming to the origins of the great religions of the world – Christianity, Islam, Judaism, Buddhism, and so on – and in these last volumes especially, I've come to the conclusion that it's really the great religions that are the ultimate patterns in history and that probably herald the future.

So I started with civilizations as my first key to unlock the secrets of history – if one could unlock them – and I've come on to a second key, which I think takes one further and that's the great religions.

How does one discover or characterize a civilization? Is there some special element that distinguishes one civilization from another?

I started by working outwards from these national units and saying to myself they are not complete in themselves. You can't understand American history from just America, and I want to see the smallest units from which you can understand America. And that carried me to what I call the Western world – Western Christendom, really – that part of the world which is only a small part of the world but much larger than any single nation,

CHINESE

Toynbee believes that Buddha represents the power of spiritual withdrawal. In this Chinese portrayal of Buddha, T'ang dynasty, the spirituality of the great religious leader emerges in a mystical manner. Buddha appears to be detached from the world, yet this isolation is a source of strength. Toynbee, in discussing this paradox, feels that the most lasting conquests are those of the great religious figures.

This picture of Ahrats giving alms to the beggars shows the pronounced contrast between the wretchedness of the poor and the serenity of the enlightened.

Sculpture is regarded as one of the most important manifestations of artistic creativity. In this Chinese sculpture of the Empress and her court from Lung-Men (6th century A.D.), we find an expression of deep piety and devotion to Buddha.

which has the same manners and customs, the same tradition, the same religion and way of life. You can't understand American history without knowing something about Western Europe, but you perhaps could understand it without knowing much about India or China or the Mohammedan world or any of the other Eastern cultures.

What kinds of attitudes are they that bind a civilization together?

Thinking of our Western civilization, I suppose it's our feeling for individual liberty – what you might call the sacredness of the individual personality. With Indian civilization, it might be a kind of other-worldiness, a feeling that material success and achievement is a kind of illusion and the real thing is something beyond, which seems rather different from our point of view. Chinese have a great feeling for family relations and tradition. You get a kind of style. Spengler uses that word of civilizations – and it distinguishes them.

These feelings bind a civilization together, but then why should a civilization decline or decay?

I suppose because of the original sin in human nature, to use old-fashioned terms, and the imperfection of human affairs. Everything human tends to break down. We're always living dangerously

Religion, according to Toynbee, is the most significant human activity. He feels that it represents the continuity of human culture and thus links the past, the present and the future. Conquerors have invaded China many times and in the end were civilized by Chinese culture. In this print of the Temple of Heaven, we see the timelessness and stability of the Chinese civilization.

Symbolism is especially important in Chinese culture as can be seen by this detail from a relief of the Dragon Spirit which is set into the stairway of the Temple of Heaven in Peiping. Through such symbolism the Chinese sought to conquer the mysterious powers of life and death.

Toynbee regards all of history as a contemporary story. In China especially, as this photograph demonstrates, the past and the present are intermingled. Traditions which date back thousands of years are perpetuated in our time. Children are still carried by their mothers whose dress has varied little throughout the centuries.

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and always have to be on our guard, for eternal vigilance is the price of everything achieved by human beings.

civilizations have had very different lengths of life. Some have lasted just a few hundred years, some a thousand or fifteen hundred.

Do you think, then, of civilization as a kind of a living organism that's bound to die?

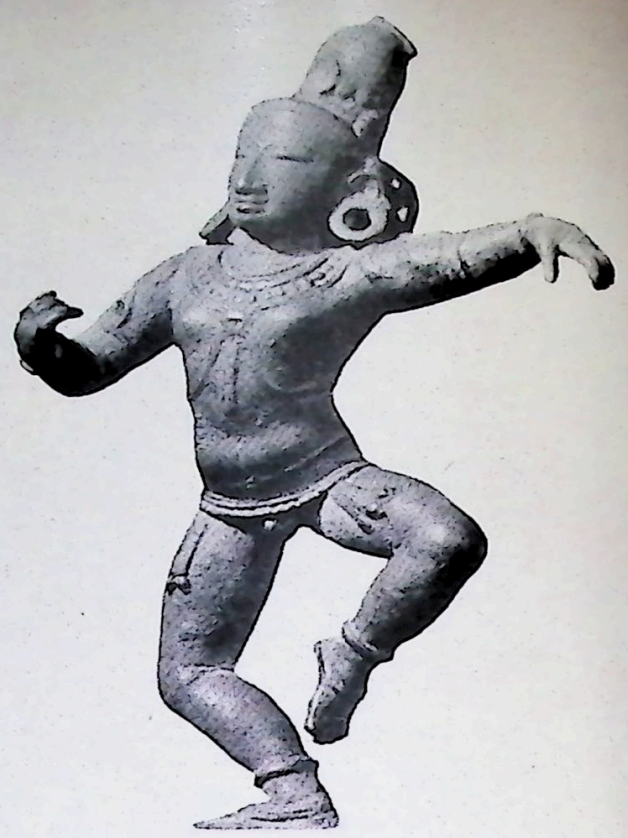
No, I wouldn't think of it like that. I think that's perhaps a false analogy. I know many people have made it, but I don't think a civilization, which is, after all, only a great network of relations between organisms – between individual human beings – is the same thing as an organism. And I think, while we know that any single organism must die sooner or later, it doesn't follow that a system of relations must die. I've noticed, for instance, that

What sorts of characteristics would those be that make the difference between a short- and a long-lived civilization?

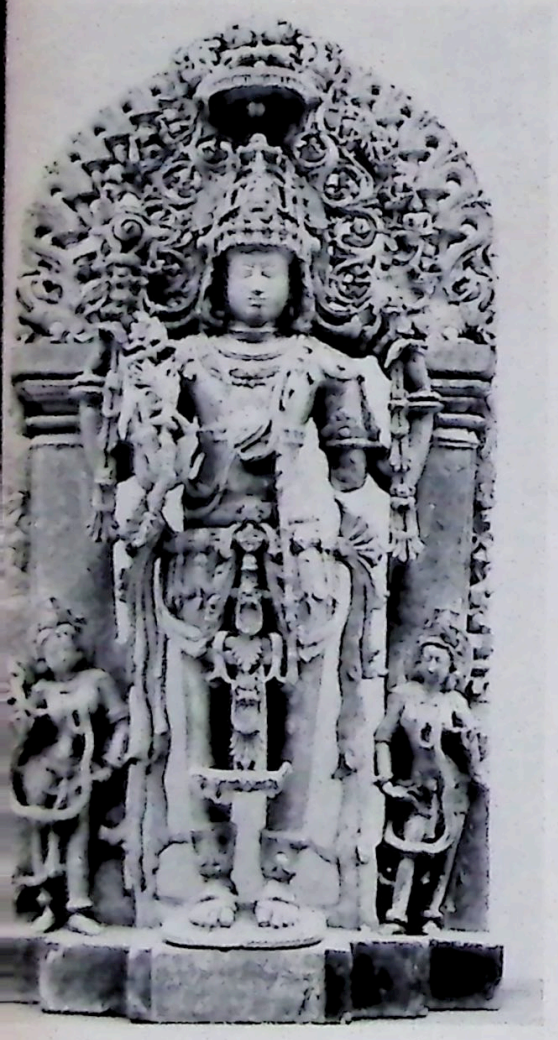
That brings me back to this phrase of mine – or rather of Robert Browning's – *challenge and response.* I think every moment of each of our individual lives and every moment in the history of a civilization, we are always being challenged by some new situation – to face it and either succeed or fail, and at any moment we may fail and begin to go under, or we may succeed and go on living.

INDIC

"Every civilization," Toynbee writes "has a style of its own in the domain of art." One of the best examples of a religious style in art can be found in an Indian sculpture of Brahma which dates to the 11th century A.D. Brahma, the chief Indian god, represents both detachment and profound understanding and is able to comprehend the varied manifestations of life.



Krishna is regarded as the god whose love unites divine and human endeavors. Toynbee regards love as the most enduring symbol of civilization.



In all civilizations, according to Toynbee, there is a creative force often represented by a diety. In India, Vishnu is a benevolent god whose portrait is shown here. It probably dates back to the 12th century and is noted for its rich ornamentation.

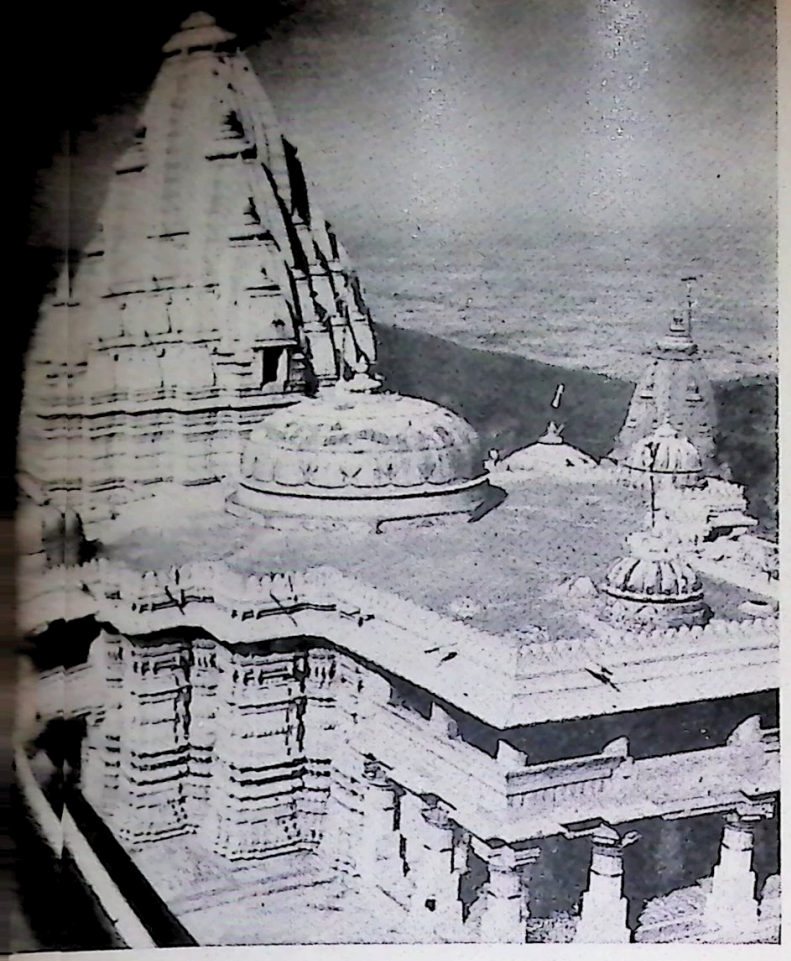
An Indian poet, Kabir, once said, "Do not go seeking the garden of flowers; for the garden of flowers is in your heart; take there your seat on the thousand petals of the lotus; there behold the perfect Beauty." This subjective approach to Indian art is symbolized by this painting of Lalita Ragini dating back to the 17th century.

Where does our civilization stand now in relation to your analysis? What is the challenge of our time and what might the response be?

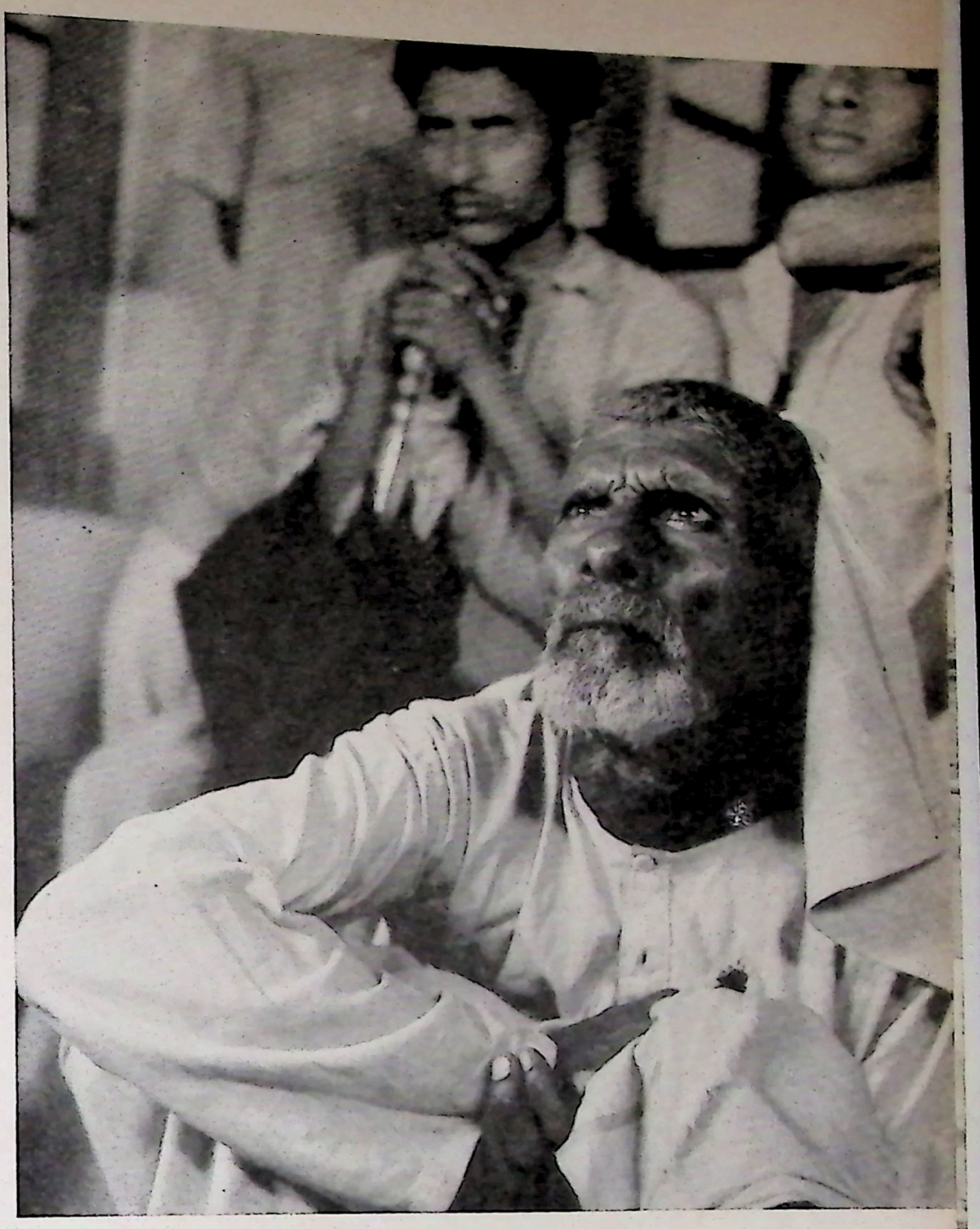
I'd say the challenge was: are we going to let ourselves go the same way as all those other civilizations in the past that have broken down and gone to pieces? We can see a lot of symptoms of the same thing, I think above all – war getting out of hand. We know what that meant in the histories of those earlier civilizations. Must we let that happen? Just fold our hands and let it go? Or can we do something about it? I believe that's a challenge. I'm personally an optimist, since I believe we have the power to save ourselves if we choose to do so, and take constructive steps against a breakdown of our civilization.

In terms of avoiding war, catastrophic war, the real challenge is for the United States and Russia to avoid war?

Yes. It isn't easy, with the whole world drawn into just two camps, and two great camps only, and then armed with these atomic weapons. I see something new there. We've never had weapons of that destructiveness before. And I see something hopeful there, too. I do think that often in the past new weapons have been invented and they've had terrible effects, I've never known in history of a new weapon which made such an effect on people's imaginations as the atomic weapons have on ours. I think people all over the world, in billions, have realized that the conditions of war have changed. I think that is a sign of hope.



Indian religion is a symbol of universality. It is the center of Indian life and its manifestations change little in succeeding centuries. In this portrait of the Temple of Parasnath, we find a mixture of deep religious feeling and decorative appeal.



The Indian government is making a concerted effort to eradicate disease and to develop higher standards of sanitation. Here a patient awaits free examination at the Patna Tuberculosis Control Demonstration and Training Centre in Bihar State, India.

Toynbee believes Indian religion has its negative aspects especially in the caste system and cow worship. The cow still remains as a perennial object of worship.

And far from being a sign of doom, then, the discovery of atomic energy gives you cause for encouragement?

Yes. We are going through a very difficult and dangerous and anxious time, obviously, but I don't see signs of just inevitable doom.

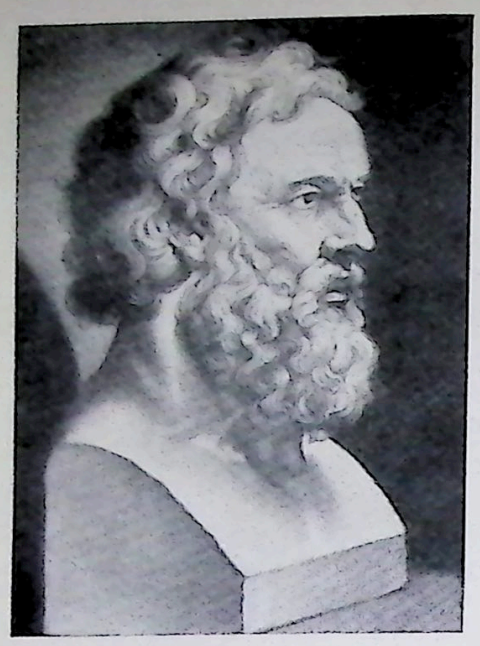
With your "Study of History" on such a cosmic scale, I wonder just how the individual relates to these civilizations you talk about.

Well, that's quite a point, isn't it? Because if one looks back over history, there are very few individuals who've obviously – well, made history, as people say. I'm thinking of Churchill in 1940, when he writes that he feels himself walking with destiny. What he meant was: he really was, himself personally, shaping things. And yet I believe myself that all individuals do make history, really. Well, Churchill might have given the lead but if 50 million men, women and children in Britain hadn't followed him, that lead would have led to nothing.

So we all, in different degrees, do count in history. After all, individuals are the only realities in history, aren't they? There's nothing else except relations between human beings. And if history isn't made by human beings, it's not made by anything else. Everything that's made and unmade, that's created and destroyed, that succeeds or fails, I think comes out of individuals.

HELLENIC 1

Greek gods often engaged in mortal combat. This picture shows Zeus hurling his winged thunderbolt at the giant Typhos. Zeus represents the forces of goodness, whereas the giant is representative of the powers of evil. This dualism, according to Toynbee, governs much of Greek civilization.



Plato believed that humanity could be improved only if the wisest ruled. His own likeness pictures a man of penetrating wisdom and lofty ideals, who experienced both triumph and disenchantment.

Toynbee believes Pericles is a modern figure and his life is representative of the dilemmas of democracy. This bronze bust of the great Greek statesman is in the Vatican Museum.

This picture of the Parthenon gives an impression of the splendor and magnificence of this ancient temple which was dedicated to the goddess Minerva. It was 60 feet high and 101 feet wide, is still regarded as an example of classic architecture.

Toynbee began his historical studies with a profound interest in Greek culture. In this picture of the University of Athens, we find a perennial expression of the Greek civilization.

It seems to me, though, you've also defined challenge in terms of religion.

Well, yes, I do believe that any challenge, when it gets down to the quick, when it puts you really up against it, brings you face to face with religion. And I think we've been rather taken unawares over that in our Western world because, after all, about two or three centuries ago, after those wars of religion we fought against each other, Catholics and Protestants, we got pretty tired of religion, as it seemed to lead to nothing but war and strife and hatred and uncharitableness, and we turned away to other things – to science, technologies – as being safe occupations, innocent compared to religion.

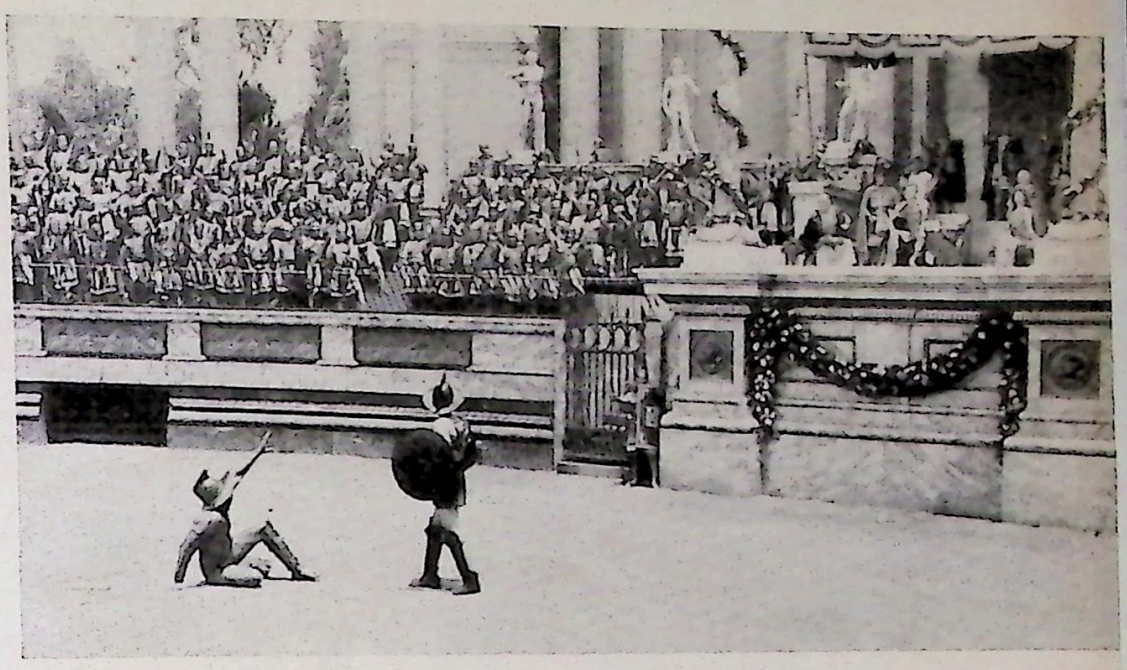
But I believe human beings can't really live without religion, and when you come against hard times, and we're living in spiritually hard times, then religion confronts you and you have to grapple with it.

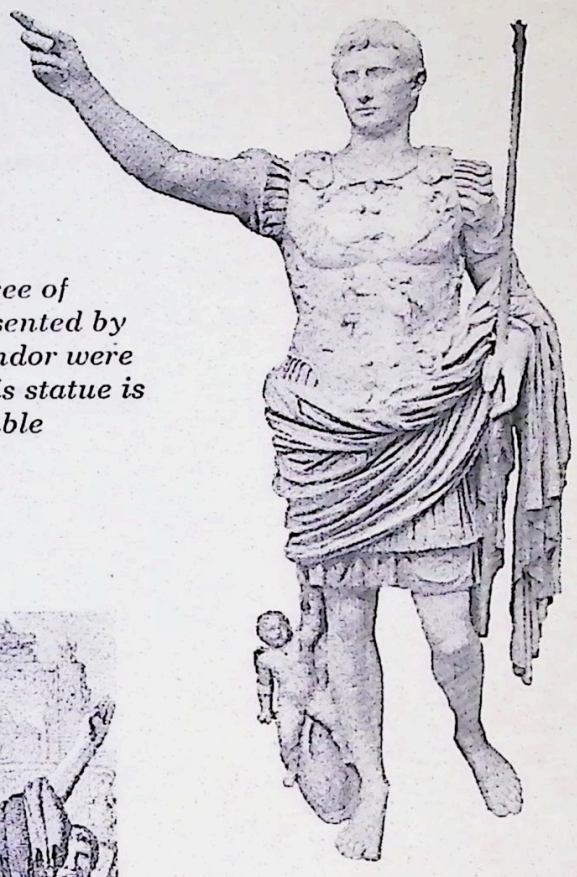
What one means by religion is difficult to state. I think I'd say I mean the mystery behind the things we can handle and touch – behind the phenomena, as we call them. Not just becoming aware that there is a mystery, but feeling pretty humble in the face of it and wishing to get into contact with it and into harmony with it. If you take religion in that broad sense, that's what I mean.

I think that if we do come back to religion, we shan't come back to it in the form in which it was when we turned away from it, because things never repeat themselves like that, and all the experience we've been through and the things we've learned will enter into our new view of religion, I would say.

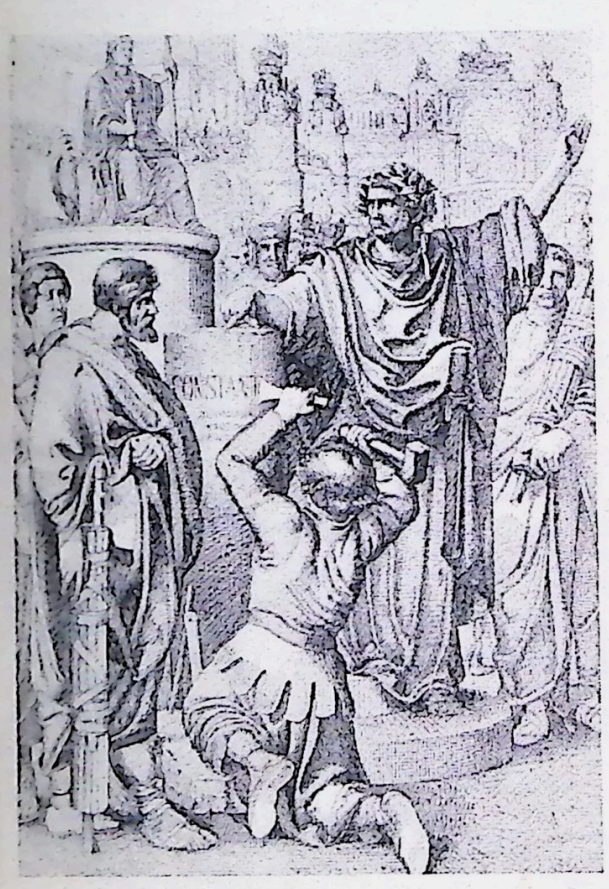
In all his works Toynbee emphasizes the centrality of the family. In this portrait of a Roman couple, which dates from the first century B. C., we find an excellent representation of Roman life. The wife is shown as being obedient; the husband radiates strength as the family head.

The gladiatorial games are a symptom of decline in Roman morality. This picture of the gladiators is taken from a contemporary film.





Every civilization aims at a degree of universality. This spirit is represented by Augustus whose power and splendor were unexcelled in ancient Rome. This statue is regarded as one of the most notable products of Roman art.



Many Roman traditions still continue in Christianity. When Constantine was converted to Christianity, he brought with him many of the old traditions and practices. In this picture, Constantine the Great makes a triumphant entry into the new city which is named after him, and this marks the beginning of a new era.

This picture shows a group of worshipers in the Colosseum listening to a speech by a Franciscan friar. They are symbolic of the importance of religion in Italy.

Where do you think the limits to our comprehension might be?

Speaking just for myself, I hope I may have learned just enough to know the limitations of my own knowledge. The more we learn, the more we realize how narrow our knowledge is.

In the physical world we see it stretching away to the infinite in one direction and to something infinitesimally small in the other. And isn't the spiritual world like that, too? The psychologists show us an infinite world inside each one of us and the great religions have shown us an infinite world outside us. I come back to what I suggested before – that we get back to that mystery behind the phenomena. If we approach that with humility, that brings us back face to face with religion.

It seems to me that your faith in the future really belies your being described as a prophet of doom.

I believe that life is action. It's action or else it's failure. I suppose that's pretty obvious in the case of practical men of action, but I'm sure it applies just as much to scholars, philosophers, historians. Like the rest of us, we have to do just the best we can with the time and the energy that we have in one lifetime, and life is short.

During that long time while I was writing that book of mine, I heard in my mental ears two verses of an English poet. He wrote 300 years ago but his words are just as much alive today. It's Andrew Marvell's lines:

But at my back I always hear time's winged chariot hurrying near. Therefore, go to it. ♦

BOOKS FOR WISDOM

FOR YOUR READING ENJOYMENT *the Editors of Wisdom recommend:*

SIGHTS AND SPECTACLES
by Mary McCarthy

In this collection of essays Mary McCarthy subjects the contemporary theatre to a searching criticism. Such authors as Maxwell Anderson, Eugene O'Neill and Clifford Odets are reviewed and given a rather harsh treatment. Mary McCarthy writes with fervor and intensity. The reader may not agree with her viewpoint, still she is always stimulating. *Farrar, Straus & Cudahy, $3.50*

THIS IS OUR WORLD
by Louis Fischer

This is a memorable portrayal of the free world. Louis Fischer, a noted journalist, has succeeded in giving an excellent description of such personalities as Adenauer, Ben Gurion and Nehru. He writes with deep understanding about the East German uprising and the continuing struggle against totalitarianism. To Fischer, Gandhi's philosophy of life is especially important in an age of turmoil and revolutionary activity. *Harper, $5.00*

Carl Becker:
ON HISTORY AND THE CLIMATE OF OPINION
by Charlotte Watkins Smith

Among American historians Carl Becker occupied an enviable place. The author of such works as *The Spirit of '76* and *The Eve of the Revolution*, Becker attempted to make history live. To Becker history was not an objective science, but an art which demanded skepticism and detachment on the part of the historian. His aim as a writer was to have the reader "go all out for reservations," for to Becker truth was relative, not absolute. *Cornell University Press, $3.75*

BELLEVUE IS MY HOME
by Salvatore R. Cutolo, M.D.
with Arthur and Barbara Gelb

In reading this fascinating description of the world's largest municipal hospital, we catch a glimpse of the progress of modern medicine. Dr. Cutolo, Deputy Medical Superintendent of Bellevue, describes the many phases of hospital life and he understands the importance of applying medicine in our daily existence. His chapters on social service are especially well done. *Doubleday, $4.00*

MINORITY REPORT: H. L. Mencken's Notebooks

During the 1920's H. L. Mencken was a storm center and his voice could be constantly heard in denunciation of puritanism. Invariably, he exaggerated the unpleasant points of the causes which he attacked. Still, he wrote with great wit and penetrating force. Mencken observed that man, "should have two lives — one for observing and studying the world, and the other for formulating and setting down his conclusions about it." *Alfred A. Knopf, $3.95*

A HISTORY OF THE ENGLISH SPEAKING PEOPLES: THE BIRTH OF BRITAIN
by Winston Churchill

In this work Winston Churchill with magnificent prose style celebrates the achievements of the Anglo-Saxon spirit. To Churchill, history represents the accomplishments of great men and thus his view of the past is essentially romantic. His accounts of Magna Charta, Henry II and Edward I are eloquent. Churchill makes history live and the past ceases to be a drab account of vague figures and dates and instead becomes part of the perennial human drama. While many contemporary historians have emphasized the impact of the environment, Churchill believes that personality shapes human events. Thus he writes, "Almost every critical turn of human fortune has been due to the appearance in an era of confusion and decay of one of the great figures of history." *The Birth of Britain* represents one of Churchill's best works and is a tribute to his skill as a writer and as a keen observer. It is destined to become a classic in historical literature. *Dodd, Mead & Co., $6.00*

THE AMERICAN LYCEUM: Town Meeting of the Mind
by Carl Bode

This is the story of the progress of adult education in the United States between 1820 and 1860. Professor Bode shows how popular the lyceum movement was, especially in New England. Many of the great writers like Emerson lectured to thousands and in this way popularized philosophy and education. *Oxford University Press, $5.00*

THE BOY IN THE MODEL T
by Stephen Longstreet

Stephen Longstreet is a writer of exceptional skill and in this book the reader learns much about the United States immediately after World War I. The trip which Longstreet describes began in April, 1919 and ended in the summer of 1920. Longstreet writes about his family with humor and detachment. The reader will smile about the adventures of the Longstreet family and their rugged experiences during the early automobile era. *Simon & Schuster, $3.50*

RETURN TO POWER
by Alistair Horne

Germany in our time remains an enigma to many observers. Alistair Horne, an English journalist, gives us a clear account of Germany in the post-war era. He describes Germany's economic prosperity and the triumphs of Adenauer. Horne is certain that National Socialism will not return and that the future of Germany is bright and promising. Horne observes: "Most of the time one admires the Germans deeply for a virtue that seems extinct in one's own country . . . work seemed to have a semi-religious significance to the Germans." *Frederick A. Praeger, $6.00*

THE NEW JAPAN
by Harold S. Quigley and John E. Turner

In this review of contemporary trends in Japan the two authors give the reader an excellent picture of the Oriental mind. The discussion of the American influence upon present-day Japan is especially well done. The authors concentrate upon political trends and thus they are concerned with the prospects of democracy in Japan. Their conclusions tend to be optimistic and they feel that the moderates will triumph in that nation. *University of Minnesota Press, $5.00*

THE CHALLENGE OF EXISTENTIALISM
by John Wild

Existentialism is a modern philosophical movement which stresses the importance of man and his aloneness in the universe. Professional writers have often regarded it as a minor movement, but John Wild indicates the importance of existential thinking for the layman and the expert. The book is a challenge to the philosophers to make their ideas more explicit and to have a greater contact with the literary ideals of our time. *Indiana University Press, $6.00*

ONE MAN'S AFRICA
by John Seymour

John Seymour has an intimate knowledge of Africa. He first went there in 1934 and he visited Kenya, Ethiopia and Zambesi. He saw both the big cities and the small towns of South Africa. He writes with eloquence and beauty about the African country-side and at the same time he describes the racial tensions and the social problems that plague this continent. *John Day, $4.00*

Great Men of Medicine

THEODOR KOCHER (1841-1917)
Pioneer in glandular surgery

WILLIAM S. HALSTED (1852-1922)
Pioneer in anesthesia

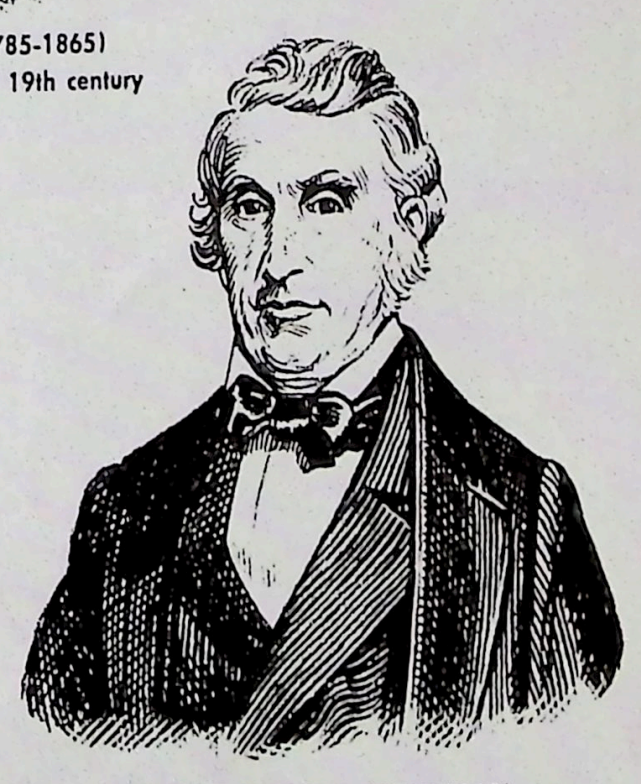
HARVEY W. CUSHING (1869-1939)
Famous neuro-surgeon

HENRY GRAY (1827-1861)
Author of "Gray's Anatomy"

VALENTINE MOTT (1785-1865)
Celebrated surgeon of 19th century

EDWARD L. TRUDEAU (1848-1915)
Researched pulmonary diseases

LEWIS A. SAYRE (1820-1900)
Founder of modern orthopedics in America



WILLIAM BEAUMONT (1785-1853)
Foremost researcher on digestion

WISDOM

THE MAGAZINE OF KNOWLEDGE FOR ALL AMERICA

Joseph Lister (1827-1912), pioneer in antisepsis and hospital sanitation, explains his methods to fellow surgeons. (Painting by O. F. Schmidt)